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BUSINESS PLANNING MODEL

USER'S GUIDE

December 1993

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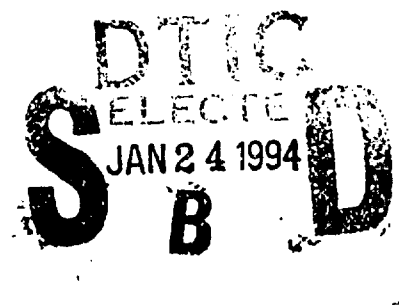
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INTRODUCTION

Welcome to the Belvoir Business Planning Model (BPM). This model was developed to provide an efficient means of collecting and analyzing data concerning future revenue projections and spending plans. The overall idea of this model is to balance the estimated costs against the available revenue. This balancing is available at any appropriate level of analysis: at the FOE/Function level; at the Laboratory/Directorate level; and at the Center level.

In general, the model tries to estimate most non-salary personnel related expenses, based upon the amount of the government payroll. It uses multiplier factors for such things as travel & transportation costs rather than having the user input these costs specifically. This frees the user from having to estimate them manually and enhances the ability to perform rapid "what if" analyses. Changes in related expenses due to simple changes in revenue or personnel projections can be quickly recalculated rather than having to completely reevaluate and reenter the "other" costs.

In addition to these analysis capabilities, the BPM offers dozens of specialized reports and an unlimited number of user-defined reports. The user is able to customize his or her own reports by defining the fields to be printed, specifying how to sort the report, and filtering out the records desired. The BPM also has an extensive on-line help system that is context sensitive, and status lines at the bottom of each screen to assist the user in navigating through the program.

As should be expected, this model does have a few complicated features. It also has some limitations. It mimics the rules you use in managing each of the types of appropriations and categories of funds, but it does not duplicate the resolution or precision of accounting systems.

As a business planning tool, the BPM collects the minimum data needed to do an efficient job at out-year planning, and to respond to external requirements for business plans and reports.

This model was targeted for experienced business planners. To effectively use the BPM, and this User's Guide, you should already be familiar with the words and methods used in resource management. You should also have some basic experience in using MS-DOS commands on your computer.

The BPM was developed by BRTRC, Inc., 8260 Willow Oaks Corporate Drive, Fairfax, Virginia, 22031, for the U.S. Army Belvoir Research, Development and Engineering Center, Fort Belvoir, Virginia under contract DAAK70-92-D-0003, Task Order 0001. The authors wish to acknowledge the invaluable contributions of Ms. Donna Dodge, Mr. Morris Zusman, and Ms. Sue McGraw for their guidance and assistance in specifying and testing this model.

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GETTING STARTED

1.0 INTRODUCTION

This first section of the User's Guide should help you to become quickly acquainted with the BPM. This includes installation, set up, movement within the program, help prompts, and other information to get you started.

1.1 Set Up

System Requirements

- MS-DOS microcomputer with a minimum of 640 KiloBytes (KB) of Random Access Memory (RAM). If you have any other programs loaded in the RAM, such as Local Area Network (LAN) drivers or communications programs, then you should make sure that there is at least 480 KB available in which to run the BPM. You can find out how much RAM you have available by running the DOS command 'mem'.
- 3 MegaBytes (MB) of available hard disk space. The BPM program itself takes up about .5 MB and the rest is for the data files and their indexes. You can find out how much hard disk space you have available by running the DOS command 'dir' or 'chkdsk'.

Installation

- Insert the distribution disk into the floppy drive and switch to that drive. For example,

C:\> A:

- At the A:\> prompt, type 'doit'. This runs a batch file which copies the program and data files onto the hard disk into a subdirectory called 'BUSINESS'.

A:\> **doit**

1.2 Starting the BPM

Normal Startup

- Make sure that you are in the BPM directory. At the DOS prompt type:

C:\> cd \BUSINESS

- Then run the program by typing 'BPM'.

C:\BUSINESS> BPM

- In a few seconds, after the model checks its data files and indexes, you should be at the BPM's main menu.

Starting the BPM with a Lab specified

The BPM database that you work with is ready to accept data for all Labs and Functions. If you want to limit your selection of data to a single Lab, and thereby make some of the menus smaller, then perform the following:

- At startup, type the Lab's three or four letter code after BPM. For example:

C:\BUSINESS> BPM CED

This will let you access data for that specific Lab only (i.e., only data for CED).

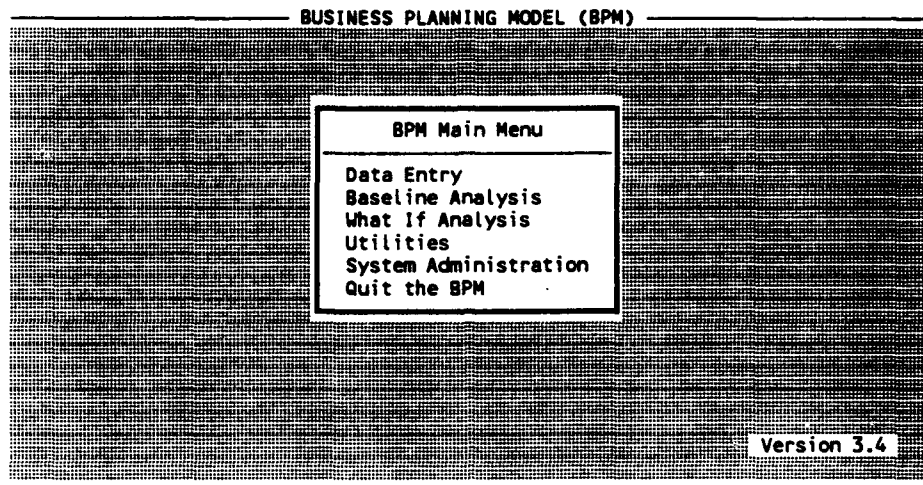
Starting the BPM as the System Administrator

You will need a password to start the BPM as the System Administrator. This is because the System Administrator has special powers and responsibilities within the program. See the System Administration module for a description of these functions. To access the BPM as the System Administrator:

- From the BUSINESS directory prompt type **BPM SYSADMIN**. You will now be prompted for a password. Enter the previously defined password.

1.3 The Main Menu

After starting up the BPM, the Main Menu is displayed, as shown below:



The principal functions of the BPM are:

Data Entry: Enter the baseline data here. At present, the BPM is wholly self-contained. That is, all the data used by the BPM is entered in the BPM. It does not access data from outside sources.

Baseline Analysis: Look at totals, balances, summaries and reports of the baseline data here. Data can be summarized by Function, Lab, Center, G&A, and each of the Tech Support Functions.

What If Analysis: Vary critical parameters and make different assumptions, to see what the impacts might be on the totals and balances obtained in the Baseline Analysis.

Utilities: This module contains those functions which are occasionally needed to maintain the BPM data.

Systems Administration: This module contains functions for the System Administrator to use to maintain and control the program.

Quit The BPM: Exit the BPM and return to DOS. You should always quit the program before you turn off your computer. If not, some of your index files may get corrupted.

1.4 Backup Procedure

All of the BPM data files are contained in the C:\BUSINESS directory. They all have the common .DBF extension. It is sufficient for you to copy your .DBF files to a new subdirectory or to a floppy disk in order to have a backup of your data. To help you do this backup, a backup program has been included with the BPM. To run this simply type 'brbackup' and then the drive to which you want to copy your files at the DOS prompt in the BUSINESS directory. You should dedicate a high density floppy disk to this purpose, since the data files can get quite large. For example, if you want to copy your files to the A: drive, you would type:

C:\BUSINESS> brbackup a:

You can also send the files to a different subdirectory on your hard disk, to a Local Area Network (LAN) drive, or to a Bernoulli disk simply by specifying the complete path of the backup subdirectory. For example, if you want to send the files to the BACKUP directory on drive H:, you would type:

C:\BUSINESS> brbackup h:\backup

Remember to perform a backup frequently, so that a possible equipment failure does not completely wipe out your hard work.

Note that you can also use the 'Copy Out Data' feature on the 'Utilities' menu to make a backup disk from within the BPM. A back-up made in this way will have fewer and smaller files because it backs up data only for a single Lab or Function.

1.5 Common Problems

- **Insufficient Memory:** If the BPM reports that it is 'Out of Memory', that means that there is not enough RAM available on your computer to perform the current function. You probably have a number of other drivers and programs loaded into RAM from your 'autoexec.bat' and 'config.sys' files. You will need to have at least 480 KB of RAM available (and preferably more) to run the BPM.
- **Open Error:** If the BPM reports an 'Open Error', it means that you do not have enough files specified in your 'config.sys' file. BPM requires that you have at least 'FILES=30' in your 'config.sys' file. More files may be necessary if you have other programs running that render less than 30 files available.

- **Corrupted Index Files:** This problem is difficult to detect. The index files can get corrupted if you accidentally turn off the computer before you exit the BPM (or in the case of a power failure). The most obvious indication that something is wrong is that data that you know you entered is now missing.

To correct this problem you should select 'Reindex the BPM Data Files' from the 'Utilities' menu. This will rebuild all of the index files.

2.0 THE BASICS

2.1 *Moving Around*

The program is driven entirely from the keyboard, by selecting items from the menus and by entering data into fields. This section describes in general the different types of menus and edit screens you will encounter, and what the function of the keys are in each.

2.2 *Understanding the Screen*

Every screen in the BPM gives you some indication about where you are and what you are doing. Using the BPM is easy if you become familiar with the information on the screen and use it to help you move around in the BPM.

Menu Lines

The top two lines of the screen are reserved for the horizontal menus (if any are activated). The first line will contain the menu items and the second line will contain a brief description of what function the highlighted menu item does.

Status Line

Located at the bottom of the screen is the Status Line. It always reminds you that you can press the F1 key for context sensitive help. In addition, it provides you some suggestions on how to proceed with the current operation.

Version Number

Directly above the status line on the right hand side is the program version number.

2.3 Vertical Menus

The Main Menu is an example of a vertical menu. You select an item by positioning the highlight bar over the desired selection and pressing **[Enter]**. Other examples of vertical menus include pull-down menus and selection lists. They all share the common feature that the selections are arrayed vertically.

To position the highlight bar in a vertical menu:

- Use the **up and down arrow** keys or the **[Tab]** and **[Shift][Tab]** keys to move up or down one line at a time.
- Type the **first letter** of the item you wish to select to move to this item.
- Use the **[Page Up]** and **[Page Down]** keys to skip forward or backward through the menu one screen full at a time. If there is only one screen to the menu, then this will just go to the top or bottom of the menu.
- When the highlight bar is over the item you want to select, press **[Enter]** to activate the item.

Every vertical menu or selection list can be closed by pressing the escape key, **[Esc]**. If a submenu is displayed, then that will return program control to the previous menu. At the Main Menu, **[Esc]** will quit the program.

2.4 Top-Line Menus

The top-line menu is displayed across the top two lines of the screen. The first line lists the commands that can be used within the current module, which are tailored to the specific needs of the module. One of the menu items is highlighted. The second line shows a brief description of what the highlighted command will do if it were selected.

To select one of the top-line menu options you have two alternatives.

- You can use the **arrow keys** (either Up and Down or Left and Right) to highlight the desired command. Then press **[Enter]** to activate the function.
- You can press the **first (capitalized) letter** of the command to activate it directly. You do not need to press **[Enter]** to activate the command in this mode.

2.5 Data Screens

Data screens display the contents of a data file record, or of several records, or of information which has been computed and is just being displayed for your use. On these screens you should be particularly aware of the status line message.

- If the contents of the data screen are of a data file record, then the message will tell you to use the **[Page Down]** key to advance to the next record and the **[Page Up]** key to return to the previous record.
- If the contents are simply computed information and do not represent a specific data file, then the status line message will tell you to press the **[Escape]** key to close the window when you are done with it.

2.6 Edit Screens

Most data screens can be activated for data entry by selecting the 'Edit' menu choice from the top-line menu. In the edit mode, the blinking cursor is turned on and the specific fields which can be edited are changed in color to light blue over a black background.

- You enter data into a field by typing it in and then pressing **[Enter]** for the data to be accepted into the field.
- You can skip to the next field without editing the current field by pressing the **down arrow** or the **[Tab]** key. You can skip to the previous field by pressing the **up arrow** or the **[Shift][Tab]** key.
- You can complete the editing by pressing the **[Page Down]** key. This will skip over any remaining fields that can be edited. At the last edit field when you press the **[Enter]** key, you will also complete the editing. Only by completing the editing will the changes you have made be saved.
- You can abort the editing at any time by pressing the **[Escape]** key. If you abort editing, then all the changes you have made on that screen will be thrown out and the screen will be redisplayed with the prior data.

When editing, whether it's a new entry or an update to an existing entry, there are three types of fields that might be encountered. The first is a **CONTROLLED FIELD**. In this type of field you have a finite choice of entries available. If your entry does not match any of this field's acceptable entries (or if you leave it blank), a list of the possible choices will appear in a pull-down menu window. You must select only the choices in this window. Entries can be selected by scrolling with the arrow keys and pressing [Enter] when the cursor is positioned on your selection. You can always activate the menu of allowable entries by entering a '?' in the field.

The second type is the **ASSISTED FIELD**, which has a menu of possible choices but entries not contained on this list are also acceptable. You can have the computer prompt you for possible choices by entering a '?' in the field.

The third type is an **UNCONTROLLED FIELD**, where anything can be entered. If you enter '?', the computer will not prompt you with a list of allowable choices. Occasionally, you will find that some of these fields cannot be left blank. At these fields, the cursor will not advance to the next field until some information is entered into the field.

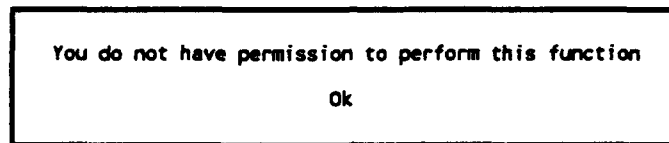
2.7 *Dialog Boxes*

A dialog box appears when BPM needs more information to perform the command you have just requested, or needs you to make a decision. Generally, a question is asked and two or more options are presented from which you are to choose. For example, the dialog box shown below asks you to decide whether to estimate the factors (by selecting 'Estimate') or to enter them directly (by selecting 'Direct').

Estimate Factors or Enter them Directly?
Estimate Direct

Use the arrow keys or the [Tab] and [Tab][Shift] key to move from option to option and [Enter] to select, or simply type the **first letter** of the option you want to execute.

A special type of dialog box will also appear to keep you informed about what is happening in the program or to warn you of a problem or an error. These boxes are always in the brown color and only offer you the option of 'Ok'. The message in the box will tell you what the problem is and what you can do about it. The most common warning will be one that tells you that the function you have just selected is reserved for the System Administrator. Simply press [Enter] to clear this box.



2.8 *Function Keys*

Four (or five) of the function keys are active in the BPM. They allow you to perform the following actions:

- [F1]: This is the context sensitive Help system which is discussed below
- [F2]: This is a list of the text files contained in your BPM directory. These text files are the output of reports that you have directed to files rather than to the printer. This feature is explained in full in Appendix A - Common Reporting Features.
- [F3]: This displays an information screen that gives you the Belvoir Customer Support phone number, and the address and phone number of the program developer.
- [F4]: This tells you the number of bytes of RAM (Random Access Memory) that you have left on your computer. This is for information only. Some program problems are caused by not enough memory available, which happens when much of the computer RAM is taken by various drivers and other programs.
- [F5]: Activates the Browse mode for the current file. Only the System Administrator can use this function key.

2.9 *Getting Help*

F1 – Context Sensitive Help

The Help system in the BPM is context sensitive. This means that Help is available anywhere in the BPM, and when called upon will be related to the area of the BPM you are currently using. To get Help, press [F1]. A window will open which describes the current feature. You can scroll the screen by using the up and down arrow keys and the [Page Up] and [Page Down] keys. To close this window press the [Escape] key.

Help screens are prepared for each vertical menu choice, each pull-down menu choice, and for each data field. Other help screens have been prepared for the occasional question which is asked. The contents of the Help screens can be edited by the System Administrator.

Customer Support

You should refer all questions concerning the BPM to the Belvoir Advanced Systems Concepts Office at (703) 704-2927.

You may also call the program developer, Neil Romstedt, BRTRC, at (703) 204-9277 for technical support.

3.0 BELVOIR SPECIFIC FEATURES

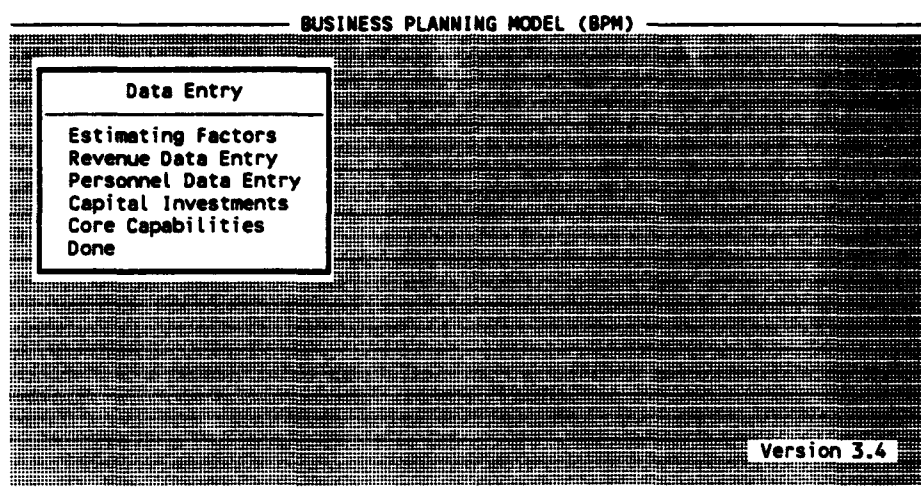
There are a number of characteristics of the BPM which have been tailored specifically to the Belvoir RD&E Center, its organizations, and its accounting methods. These may not apply to other agencies which might be interested in using the model.

Throughout this User's Guide, those features which are specific to Belvoir are marked. You should refer to Appendix B for a more complete description of these features and how you might work around them.

***DATA ENTRY
MODULE***

1.0 INTRODUCTION

The Data Entry Module is used for entering and listing your data. At present, the BPM is wholly self-contained. That is, all the data used by the BPM is entered in the BPM. None of the data is automatically extracted from other sources. There are five kinds of data collected which correspond to the options on the Data Entry Menu:



The options on the Data Entry Menu are selected by highlighting the desired item and then pressing [Enter]. The Data Entry options are:

Estimating Factors: Estimating factors are used for predicting the non-salary personnel-related expenses, such as Travel and Transportation and Materials and Supplies. Factors are used instead of entering exact values because it is unreasonable to predict exact costs without having any certainty in revenues. Factors also allow the model to calculate expenses under 'What If' conditions without requiring an extensive analysis of costs.

Revenue Data Entry: Predicted revenues and their associated major elements of cost (other than in-house costs) are entered for each Lab and Function within the Center. Each revenue is specifically identified and the expected revenues are entered. If portions of the revenue will be expended on

external costs, such as support contractors, other government agencies, major contracts, or for major capital investments, then these cost elements are tied to their revenues.

Personnel Data Entry: The personnel data are the foundation for estimating the in-house costs. Each organization enters their predicted personnel workyears, and their support contractor workyears. The estimating factors are used here to compute the "loaded" in-house costs associated with the personnel. Workyears are identified by type of employee so that reasonable analyses of costs can be made. Of course, an objective of the BPM is to make certain that there are enough revenues (less major externals) to cover the in-house costs associated with personnel.

Capital Investments: The capital investments reported in this module are only those which are not directly chargeable to a specific revenue source. They are reported separately, rather than by simply using an estimating factor, to collect the data needed for capital budgeting purposes. Based on these entries, the model calculates a factor that will be used in the applicable Baseline and "What If" analyses.

Core Capabilities: Core capabilities are the twenty-two standard work measures defined by AMC for categorizing the general types of work done by AMC. The data entered in this section are needed to respond to the AMC mandated reports of how workyears and external costs are expended.

1.1 Selecting the Lab and Function

When you select one of these five areas for data entry, you will be asked to specify a Lab and Function to work with. A list of the Labs and Functions will be displayed. Select from the menu the one you want and press [Enter]. The appropriate data screen will appear with your view into the data file confined to the specific Lab and Function you selected. Once you have selected an organization to work with, the program will automatically position itself on that Function as you go into other data entry areas.

As was stated earlier, you can limit the list of organizations to a specific Lab. When starting up the program, type the three or four letter Lab code after BPM (i.e., BPM CED). This will limit the menu to only the Functions for the specific Lab (i.e., only data for CED).

1.2 Common Menu Options

The top-line menu items in all five areas of the Data Entry Module share a lot in common. The top-line menu choices you will encounter are:

- Edit:** Allows you to enter and/or correct data in the visible record. Sometimes, this will bring up a pull-down menu to let you edit specific parts of the visible record.
- Add:** Creates another record in the database and puts you into the edit mode. The new record will already be keyed to the currently selected Lab and Function.
- Goto:** Lists the records for this Lab and Function so you can go to a specific record. Simply highlight the record you want and press [Enter] to go to it.
- List:** Displays a submenu of the available reports for this data entry screen. There are some common features in all of these submenus. Refer to the description of Common Reporting Features in Appendix A. Only the specialized reports in each data entry area will be discussed in this section of the text.
- Delete:** Deletes the visible record. When you delete this record, the screen displays the next record for this Lab/Function. If there are no records remaining, then a message in the window reports that fact. When records are deleted, the space they occupy in the data file is not immediately recovered. You will be given the opportunity to Remove the Deleted Records when you exit the program to recover the unused space.
- Move:** Moves this revenue or personnel record to a new Lab or Function. When the program moves the revenue or personnel record, then any associated records in the other data files (i.e., wkys, externals, internals, and products) are also moved.
- Post:** Transfers the computed replacement cost (on the Capital Investment Screen) to the actual replacement cost line. This is so you do not have to type in the computed values.
- Quit:** Quits the current menu and returns you to the previous menu (or you can use the [ESC] key to quit).

2.0 ESTIMATING FACTORS

Estimating factors are used for estimating the non-salary personnel-related expenses. Each factor is a decimal fraction, that when multiplied by the total government salary cost for that year equals the total cost in that category of expense. The factors can be different for each Lab and Function to represent the distinct differences among the Functions. Each must be entered separately. The screen below illustrates the factors for a single Lab/Function.

Lab: CED	Function: BDGING							
	1993	1994	1995	1996	1997	1998	1999	2000
Indirect	0.1083	0.1083	0.1083	0.1083	0.1083	0.1083	0.1083	0.1083
Tvl & Trans	0.0495	0.0495	0.0495	0.0495	0.0495	0.0495	0.0495	0.0495
Matl & Supply	0.0124	0.0124	0.0124	0.0124	0.0124	0.0124	0.0124	0.0124
Training	0.0124	0.0124	0.0124	0.0124	0.0124	0.0124	0.0124	0.0124
IMO Tech Supt	0.0062	0.0062	0.0062	0.0062	0.0062	0.0062	0.0062	0.0062
FSD Tech Supt	0.0124	0.0124	0.0124	0.0124	0.0124	0.0124	0.0124	0.0124
ILS Tech Supt	0.0186	0.0186	0.0186	0.0186	0.0186	0.0186	0.0186	0.0186
PAE Tech Supt	0.0371	0.0371	0.0371	0.0371	0.0371	0.0371	0.0371	0.0371
Cap Invest	0.0757	0.0790	0.0874	0.1258	0.0800	0.3397	0.0960	0.0959
Awards	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benefits	0.1331	0.1331	0.1331	0.1331	0.1331	0.1331	0.1331	0.1331
Totals (+1)	1.4657	1.4690	1.4774	1.5158	1.4700	1.7297	1.4860	1.4859

As you can see, there are many displayed factors with values for each of the eight years of the model's planning horizon, and they are totalled across the bottom of the window. These factors are:

Indirect: The indirect factors will be fractions that when multiplied by the total civilian salary cost for the selected Function will equal the dollars planned for that Function's contributions to Laboratory indirect support, for the specified year. This factor should only be used by the directorates which maintain distinct indirect staffs, and only if an Indirect Function for this Laboratory is included in this model. The BPM will accumulate the funds created by this indirect factor into a pool that will be balanced against the costs of the Indirect Function.

Travel & Transportation: The travel and transportation factors will be fractions that when multiplied by the total civilian salary cost for the selected Function

will equal the dollars planned for that Function's travel and transportation costs, for the specified year. Travel and transportation costs of other Labs and Functions will be reported by those organizations. Contractor costs should be reported as externals.

Material & Supplies: The material and supplies factors will be fractions that when multiplied by the total civilian salary costs for the selected Function will equal the dollars planned for that Function's material and supplies costs, for the specified year. Material and supplies costs of other Labs and Functions will be reported by those organizations. Contractor costs should be reported as externals. Material and supplies costs reported should include general supplies, maintenance supplies, and other supplies which are not reported as capital investments.

Training: The training factors will be fractions that when multiplied by the total civilian salary costs for the selected Function will equal the dollars planned for that Function's training costs, for the specified year. It should not cover the salary costs for personnel while they are on training, but it should include the cost of tuition or registration fees.

IMO: The Information Management Office (IMO) Technical Support factors will be fractions that when multiplied by the total civilian salary cost for the selected Function will equal the dollars planned for that Function's IMO tech support costs, for the specified year. It covers tech support services you receive, not those that you supply. IMO tech support services include computer services (PC maintenance, e-mail, application design & maintenance, non-PC application operation), graphics support, teleconferences, video services (taping & repro), photography, and exhibits. This is a Belvoir-specific factor (see Appendix B).

FSD: The Facilities Support Directorate (FSD) Technical Support factors will be fractions that when multiplied by the total civilian salary costs for the selected Function will equal the dollars planned for that Function's FSD tech support costs, for the specified year. It covers tech support services you receive, not those that you supply. FSD tech support services include motor pool and model shop services. This is a Belvoir-specific factor (see Appendix B).

ILS: The Integrated Logistics Support (ILS) Technical Support factors will be fractions that when multiplied by the total civilian salary costs for the selected Function will equal the dollars planned for that Function's ILS tech support costs, for the specified year. It covers tech support services

you receive, not those that you supply. This factor should only be used by the hardware directorates (i.e., LED, CED, CSD, and the materials portion of PAED). This is a Belvoir-specific factor (see Appendix B).

PAE: The Product Assurance and Engineering (PAE) Technical Support factors will be fractions that when multiplied by the total civilian salary costs for the selected Function will equal the dollars planned for the Function's PAE tech support costs, for the specified year. It covers tech support services you receive, not those that you supply. PAE tech support services include test operations, RAM and all materials work paid for by work orders. This factor should only be used by the hardware directorates (i.e., LED, CED, CSD, and the materials portion of PAED). This is a Belvoir-specific factor (see Appendix B).

Capital Investment: The Capital Investment factors will be fractions that when multiplied by the total civilian salary costs for the selected Function will equal the dollars planned for the Function's capital investment costs, for the specified year. Since the planned capital investments are directly entered into their own data file, these factors are automatically calculated from the Capital Investment data in the Baseline Analysis (see paragraph 2.4, page 52). You cannot edit these factors.

Awards: The Awards factors will be fractions that when multiplied by the total civilian salary costs for the selected Function will equal the dollars planned for the Function's incentive awards, for the specified year.

Benefits: The Benefits factors will be fractions that when multiplied by the civilian salary costs for the selected Function will equal the dollars planned for the Function's contribution to the employee benefits cost pool (i.e., leave, insurance, retirement, etc.), for the specified year. These factors are the same throughout the Center, and they are entered by the System Administrator.

Two other sets of factors do not appear on this screen, but affect the cost calculations:

G&A: The G&A factors will be fractions that when multiplied by the civilian salary and benefits costs for the selected Function will equal the dollars planned for that Function's contribution to the G&A cost pool. Only certain revenues (and hence salaries/benefits costs) are liable for this G&A surcharge. In general, the surcharge is applied only to non-OMAD and non-DBOF revenues (and to salaries/benefits paid by those revenues) received by all

Labs/Functions except G&A and Tech Support. The G&A factors are the same throughout the Center, and they are entered by the System Administrator. This is a Belvoir-specific calculation that may be different in other commands (see Appendix B).

Inflation: The Inflation factors will be fractions that predict the growth of basic salary costs over the eight years of the planning horizon. Since the costs computed from factors are based on the civilian salary costs, they in turn will be inflated. The Inflation factors are the same throughout the Center, and they are entered by the System Administrator.

2.1 Editing Factors

Factors are edited for the current Lab and Function by selecting the factor from the 'Edit' pull down menu. A window opens asking if you wish to estimate the factor or enter the factors directly into the data screen. These two options are described below:

Estimate Factor:

If 'Estimate' is chosen, a window opens asking for an estimate based on total expenses from last year, as shown below:

Estimate Factors Using Totals from Last Year	
Total Expense of this Type (\$K):	<input type="text"/>
Total Civilian Pay (\$K):	<input type="text"/>

The program asks you to enter a historical actual cost for the element of expense for the Lab/Function selected, and a corresponding actual total civilian salary cost. The values entered should be in \$K (where 1\$K = \$1,000). The actual cost divided by the total civilian pay cost for the Lab/Function will result in the factor that will be applied to all the planning years.

Note that this actual cost and the total salary cost value should have the same base year (i.e., FY92 actual cost and FY92 total civilian pay cost).

Also note that the same computed factor will be applied to all the years and will wipe out any previous values that you had entered for that factor. Therefore, be sure to write down any important data that you have before you estimate the factors. If you are going to estimate a factor, it is a good idea to plan to do that before you do any direct editing of the factors.

Direct Editing

If you select 'Direct' editing of the factors, the program allows you to enter the factors directly by year on the data screen. Each field should contain the factor to be multiplied by the total civilian salary cost for the appropriate year to estimate the planned cost for this element of expense.

In direct editing, a different factor can be entered for each year to allow for differences in anticipated costs.

2.2 *Average Factors Report*

The average factors report is the only specialized report for this section. This report prints the weighted average of the factors for a single Lab or for the Center as a whole. The averages exclude the non-TDA organizations. The factors for each Function are weighted by the civilian salary cost of that Function in computing the averages. The report prints out the factors in a format much like the data entry screen.

3.0 REVENUE DATA ENTRY

Revenue and revenue-related data for a specific Lab and Function are entered in this section. A Lab and Function must be selected before proceeding (see Section 1.1).

Each revenue can be identified by its office, group, source, appropriation, category, MDEP, program element, project number, task/point account, PMS number, and/or basis. Each of these terms will be defined separately below. An organization might have several revenue records, one for each distinct revenue.

The related data are the Major External, the Support Contract Costs, the Capital Investments, the Internal Transfers, the Products and Projects, the Carryover, and the Direct Workyears which are tied to this particular revenue.

Certain organizations (particularly the G&A organizations) are not expected to have external revenues. In fact, the System Administrator can prevent them from creating external revenues (see 'Organization Table Edit' in 'System Administrator Module'). These organizations are, however, expected to enter their anticipated internal transfer revenues, major externals and support contractor costs, as well as any costs they may incur as a result of internal transfers to other organizations.

The bottom of the window shows the remaining funds to be spent in-house, the G&A surcharge which will be applied to those funds, and the remaining amount available to apply to salaries and personnel-related costs.

Revenue								
Lab: CED	Function: BDGING	Office: ABCD						
Group: INTERN	Source: BATDEC	APPN: RDTE	Cat: 6.2					
MDEP: RK01	PE: 62786	Proj No: AH20	Task/PtAct:	PMS:				
Basis: POM 3.3 5/92								
(\$K)	1993	1994	1995	1996	1997	1998	1999	2000
Revenue:	654	775	644	898	941	1149	1186	1221
Carry (+):	20	30	20	5	0	0	0	0
Externals:	421	559	421	542	508	631	638	699
Supt Cont:	0	0	0	0	0	0	0	0
Cap Invest:	0	0	0	0	0	0	0	0
Internals:	40	40	40	40	40	40	40	40
Carry (-):	30	20	5	0	0	0	0	0
=====	=====	=====	=====	=====	=====	=====	=====	=====
In House:	183	186	198	321	393	478	508	482
G&A Slice:	4	25	39	33	87	103	131	131
Available:	179	161	159	288	306	375	377	351
Direct Wkys:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

The G&A surcharge is computed here by working backwards from the amount of money that is available for in-house costs. Since all the in-house costs are expressed as factors based on the aggregate government salary cost, the salary cost can be directly computed and hence the G&A surcharge can be directly computed.

The rules for applying the G&A surcharge to revenues are straightforward, but may be peculiar to Belvoir.

- G&A surcharge is not applied to direct OMA or DBOF revenues in any organization.
- G&A surcharge is not applied to any revenues received by any G&A or Tech Support Function, or to any non-TDA organization. The System Administrator needs to create OTM Functions to handle the rare cases where a G&A or Tech Support organization would be charged for G&A.
- All other revenues are subject to the G&A surcharge.

The G&A surcharge is computed from the revenues rather than directly from the personnel because the revenues and personnel costs may not be in balance. This is unlike the actual accounting system which bases the G&A surcharge on personnel. The BPM assumes that the Center will reclassify the personnel to spend the kinds of money that are received as revenues. Therefore, it is more appropriate to base the expected G&A surcharge on the revenues rather than on the arbitrary assignment of personnel.

The remainder of this section describes the types of inputs that are expected in the revenue section. They are all accessed from the 'Edit' menu option.

3.1 Revenue ID Data

Selecting this item allows you to edit the identifying data for this revenue record. The fields to edit are the office, group, source, appropriation, category, MDEP, program element, project, task/point account, PMS number and basis. These are individually defined below. If you are an organization which is restricted from entering external revenues but need to enter the related costs, then you will only be given access to the basis field.

Office: This field should either be left blank or it should contain the office symbol of the part of the Lab which is to execute this revenue. If it is not left blank, then the office symbol used must be already defined by the System Administrator in the offices file.

Group: This field must contain the group name corresponding to the source of the funds (i.e., the group is a superset of the source field). One of the following predefined groups must be entered:

DIRECT: This revenue is anticipated to be directly appropriated to Belvoir by Congress. On its way to Belvoir, it might be processed by other agencies (such as AMC). But it is direct as opposed to customer revenue. All the other groups are a form of customer revenues and only serve to identify who the customer is.

AMC: This revenue is anticipated to be received from a customer which is a part of AMC, but not a part of Belvoir (e.g., ARL or MICOM).

ARMY: This revenue is anticipated to be received from a customer which is an Army agency, but not a part of AMC (e.g., DCSLOG or PEO-ASM).

DOD: This revenue is anticipated to be received from a customer which is a Department of Defence service or agency, but is not a part of the Army (e.g., Marine Corps or Defense Nuclear Agency).

GOVT: This revenue is anticipated to be received from a customer which is a U.S. Government agency, but which is not a part of the Department of Defense (e.g., Department of Energy or National Institute of Health).

OTHER: This revenue is anticipated to be received from any other customer which is not a part of the U.S. Government (e.g., a foreign government or from Industry).

INTERN: This revenue is anticipated to be received from an internal transfer within Belvoir, regardless of the original source of the funds. This should be used to identify specific technical activities that are transferred (along with funds). This may be used instead of, or as a complement to, the 'Tech Support' factors which are separately handled in the BPM.

- Source:** If the group is 'DIRECT', then the source must also be 'DIRECT'. Otherwise, this field should contain the name or acronym of the customer that is providing the revenue. This field must not be left blank. There is a pop-up list of sources for you to select from, which is sensitive to the group you have entered. The list can be edited by the System Administrator. If your specific source is not available for selection, then select OTHER and type in the source name directly into the field. The source you name in this way should correctly belong to the group you have selected. If the group is INTERN, then the source will be one of the other Functions within Belvoir.
- APPN:** This field must contain the appropriation type for the revenue being entered. The allowable appropriation types for revenues are:
- RDTE:** Research, Development, Test, and Engineering funding.
- OMA:** Operations and Maintenance, Army funding.
- PROC:** Procurement funding.
- DBOF:** Defense Base Operating Fund funding.
- OTHER:** May be selected if none of the other types are appropriate.
- Category:** This field contains the appropriation category for the anticipated revenue. The allowable categories depend upon the appropriation type entered in the APPN field.
- MDEP:** This field should contain the Management Decision Package (MDEP) for the revenue. It will be used, along with the PE and Project Number, to validate this revenue with the RDA and LRRDAP databases. This is an optional entry.
- PE:** This field should contain the Program Element (PE) for the revenue. It will be used, along with the MDEP and Project Number, to validate this revenue with the RDA and LRRDAP databases. This is an optional entry.
- Project Number:** This field should contain the Project Number for this revenue. It will be used, along with the MDEP and PE, to validate the revenue with the RDA and LRRDAP database. This is an optional entry.

Task No./

Point Acct: This field may contain the Task Number (if the appropriation is RDTE) or the Point Account (if the appropriation is OMA) for this revenue. This is an optional entry which is used to associate this revenue with the APPS or PMS databases.

PMS: This field may contain the PMS (for Program Management System) number associated with this revenue. This number is assigned as part of a Belvoir-specific database management system which is used to track the planning and execution of specific programs. This is an optional entry.

Basis: The entry in this field should provide the information necessary to link this revenue back to a funding document such as the POM or LRRDAP, when possible. It should also describe any assumptions used in estimating the revenues anticipated (for example: "LRRDAP, DTD 01/92, based on 5% of STAMIDS production line"). If the revenue cannot be linked to a funding document, this field should explain why the revenues are anticipated (example: "Support agreement DTD 02/92 with sources"). Organizations which do not enter revenues, but which create a revenue record from which to report their externals and support contractor costs, should use the Basis field to identify their records.

3.2 Revenue Amount

The revenue amount fields should contain the values representing the \$K expected to be received from this revenue source for each year. These values should reflect only revenues that will be received and managed by Belvoir.

Deciding which revenues to report can get a bit tricky. As a guideline, revenues should be reported only for the dollars Belvoir will receive. For example, you should not report the procurement dollars for a project unless Belvoir will directly receive the procurement funds. Do not report the procurement dollars going out to a contract unless Belvoir will be executing that contract. You should report only the portion of the procurement line that Belvoir will receive to provide engineering support to production.

3.3 Major Externals

The Major Externals include MIPRs (Military Interagency Purchase Request) to other government agencies, hardware contracts with industry, contracts with universities, etc. Major Externals should exclude support (time and materials) contracts, MIPRs with non-TDA organizations (such as IMO and CPO) whose costs are captured separately within the BPM, and any other expenses captured by other data fields such as capital investments or materials and supplies.

These Major Externals are linked directly to the revenue record being displayed. You view them by selecting 'Major Externals' from the 'Edit' menu of the revenue screen. You can have any number of Major Externals for each revenue. They will be added and their sum displayed on the underlying revenue screen.

The Major Externals window appears as shown below. The Lab and Function fields are already filled in to match the revenue record.

							Major Externals	
Lab: CED	Function: BDGING	Priority: 1						
External To: OTHER	Vendor: INDUSTRY							
(\$K)	1993	1994	1995	1996	1997	1998	1999	2000
	-----	-----	-----	-----	-----	-----	-----	-----
Ext Amount:	421	559	421	542	508	631	638	699
Ext For: TECH DEMOS								

The following are the data entry fields for the Major Externals section:

Priority: Enter the priority for this external among the competing externals associated with this revenue record. This priority should consider all the externals (the Major Externals, the Support Contracts, and the Capital Investments) associated with this revenue record. This is particularly important in the BPRR (Budget and Program Resource Review) process.

External To: This field is just like the 'group' for the outgoing external vendor (see the definitions of Group for the incoming revenue record). What is captured here is the 'group' of the vendor. The allowable choices are: AMC, ARMY, DOD, GOVT and OTHER. You cannot select DIRECT or INTERN for the outgoing funds.

Vendor: This field should contain the name or acronym of the external agency receiving the dollars. The vendor should belong to the vendor 'group' you have just selected. If the receiver will be a company but the specific company has not been determined, select 'INDUSTRY' for this entry and 'OTHER' for the group.

This field cannot be left blank. You will be offered choices from which you can select, or you can type another entry directly into the field. If you do not know whether the receiver will be a government organization or industry, enter 'UNKNOWN' into this entry.

External Amount: These fields should contain the estimated value in \$K for this external expense for each year.

External For: This field should include a general description of the items or services to be purchased with this money.

3.4 Support Contracts

The Support Contracts include the costs of task orders issued under the Center's Time and Materials contracts that are directly chargeable to this revenue source. The values entered here represent the total anticipated task order costs, both labor and materials. Workyear estimates for contractors also need to be entered in the personnel data entry section.

These Support Contracts are linked directly to the revenue record being displayed. You view them by selecting 'Support Contracts' from the 'Edit' menu of the revenue screen. You can have any number of Support Contracts for each revenue. They will be added and their sum displayed on the underlying revenue screen.

Lab: CED Function: BDGING Priority: 1							Support Cont	
External To: T&M		Vendor: PROTOTYPE						
(\$K)	1993	1994	1995	1996	1997	1998	1999	2000
	-----	-----	-----	-----	-----	-----	-----	-----
Cont Amount:	64	67	69	72	74	77	79	82
Ext For: MODEL BUILDING								

The following are the data entry fields for the Support Contracts section:

- Priority:** Enter the priority for this external among the competing externals associated with this revenue record. This priority should consider all the externals (the Major Externals, the Support Contracts, and the Capital Investments) associated with this revenue record. This is particularly important in the BPRR (Budget and Program Resource Review) process.
- External To:** This field is just like the 'group' for the outgoing external vendor (see the definitions of Group for the incoming revenue record). What is captured here is the 'group' of the vendor. The only allowable choice here is just T&M, and it is already filled in for you.
- Vendor:** This field must contain the name or acronym of the support contractor (or the contract) receiving the dollars. It cannot be left blank.
- Contract Amount:** These fields should contain estimated values in \$K for this support contract for each year.
- External For:** This field should include a general description of the items or services to be purchased with this money.

3.5 Major Capital Investments

The Capital Investments reported under revenues are only those which are directly chargeable to a specific revenue source. If the revenue were not to be received, then this investment would not be made. It is assumed that since these investments are required to accomplish a very specific mission, they will not be replaced at the end of their useful life. Therefore, no replacement cost is included in the planning data for these items.

Other Capital Investments of a more general nature are reported in the Capital Investments section (see Paragraph 5.0 below).

These Capital Investments are linked directly to the revenue record being displayed. You view them by selecting 'Capital Investments' from the 'Edit' menu of the revenue screen. You can have any number of Capital Investments for each revenue. They will be added and their sum displayed on the underlying revenue screen.

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Lab: CED Function: BDGING Priority: 1							Maj Cap Inv	
Asset Type: TEST EQUIP		Asset: ELECTRONIC TEST SUITE						
(\$K)	1993	1994	1995	1996	1997	1998	1999	2000
	-----	-----	-----	-----	-----	-----	-----	-----
Cap Inv Amt:	0	24	0	0	0	0	0	0
Benefit: SPECIALIZED REQUIREMENT FOR BRIDGE STRESS ANALYSIS								

The following are the data entry fields for the Major Capital Investments section:

Priority: Enter the priority for this external among the competing externals associated with this revenue record. This priority should consider all the externals (the Major Externals, the Support Contracts, and the Capital Investments) associated with this revenue record. This is particularly important in the BPRR (Budget and Program Resource Review) process.

Asset Type: This field must contain the type of asset in which the investment is planned. The asset types include: ADP (Automatic Data Processing equipment such as computers and peripherals); A/V (Audio/Visual Equipment such as projectors, televisions, and VCRs); LAB EQUIP; TEST EQUIP; VEHICLES; FACILITIES; FURNITURE; and OTHER. Select OTHER only if no other specific category is applicable.

Asset: This field must identify specifically what item(s) are being purchased (example: 6 widget testers). A separate Capital Investment record should be created for each group of items with a different asset identification. Do not leave this field blank.

Capital Investment Amount: These fields should contain the estimated values in \$K for this capital investment in each year.

Benefit: This field should include a brief but specific reason for investing funds for the purchase of the specified new investments asset. The benefit should capture the essence of the need or deficiency driving the capital investment.

3.6 Internal Transfers

The Internal Transfers of funds from this revenue source to other Lab/Functions are reported here. These transfers should not duplicate the funding of Tech Support organizations which is accomplished by the estimating factors.

These Internal Transfers are linked directly to the revenue record being displayed. You view them by selecting 'Internal Transfers' from the 'Edit' menu of the revenue screen. You can have any number of Internal Transfers for each revenue. They will be added and their sum displayed on the underlying revenue screen.

Internal Transfers								
Lab: CED	Function: BDGING							
To Lab: LED	To Function: MARINE				To Office:			
(\$K)	1993	1994	1995	1996	1997	1998	1999	2000
Int Trans:	40	40	40	40	40	40	40	40
Trans For: MISCELLANEOUS SUPPORT								

The following are the data entry fields for the Internal Transfers section:

To Lab: Enter the Lab code to which the funds are planned to be transferred.

To Function: Enter the Function to which the funds are planned to be transferred. The Function must be part of the Lab.

To Office: Enter the Office to which the funds are planned to be transferred. This is an optional entry.

Internal Transfer Amount: These fields should contain estimates of the amount in \$K of this planned internal transfer in each year.

Transfer For: This field should include a brief but specific reason for the planned internal transfer.

Note that for every internal transfer out of your Lab/Function, there should be a corresponding revenue, marked with the group INTERN, coming into the receiving Lab/Function. However, you cannot guarantee that the other organization will create a matching revenue, or that the funding amounts will be the same. Therefore, an analysis of internal transfers will have to be made (this is done in the Baseline Analysis Module)

to see how well expectations of internal transfer revenues match up with the plans for internal transfer costs.

3.7 Products and Projects

The Products and Projects are the items to be produced and/or delivered to this customer in exchange for the anticipated revenue. You can have any number of Product and Project records for each revenue. Add additional records as necessary.

You view them by selecting 'Products and Projects' from the 'Edit' menu of the revenue screen.

Products	
Lab: CED	Function: BDGING
Product: DESIGN & REPORT	
Project: HEAVY ASSAULT BRIDGE	
Due Date: 02/06/97	

The following are the data entry fields for the Products and Projects section:

Product: This field should contain a generic description of the product which will result from this effort (such as Tech Data Package). A future effort will be made to create a list of generic products for you to select from.

Project: This field should contain the project name for which this product is being delivered.

Due Date: This field should contain the date on which this product is anticipated to be due.

3.8 Direct Workyears

The direct workyears entered at the bottom of the revenue screen are the workyears needed to perform the work demanded by this revenue. You should include all full time and part time government workyears as well as those provided by support contractors. You should not include the government workyears for managers or secretarial support, or workyears provided by major contractors.

Enter the workyears directly into the Revenue record data entry screen, by selecting 'Direct Workyears' from the 'Edit' menu for the revenue record.

3.9 *Carryover*

Carryover is the mechanism used for carrying funds over from one year to the next. Under normal circumstances, revenues (particularly direct revenues) are required to be spent in the year that they are received. The need to carry over funds might occur because of timing problems encountered in spending the funds in the year that they are received, or for any number of other reasons.

You are allowed to specifically enter the carryover of funds from one year to the next on each revenue record. The first entry is the carryover of funds in \$K into the first year (which is the execution year). This is treated as additional revenue for the execution year.

Then, you can enter the carryover out of each year and into the next year. Each entry will be counted as a reduction of revenue in the year from which the funds are taken and an increase of revenue in the next year. As you enter the carryover, the revenue screen is automatically updated.

Note that expenses which are planned against carryover funds should be scheduled in the year that they are executed, not in the year that the funds are received. This helps to ensure that total revenues and total expenses in each year are kept in balance.

3.10 *Deleting Revenue Records*

When you add a revenue record, you also automatically add a single empty record to each of the associated files for major externals, support contracts, capital investments, products and projects, and internal transfers. As you edit the revenue data, you might also add additional records to these associated data files.

When you try to delete a revenue record, the program offers you the option of automatically deleting the related records in the associated files.

There are External, Internal, or Product records
associated with this revenue. Delete them too?

No Yes

The default answer 'No', will not delete anything. The 'Yes' answer deletes the associated records and the current revenue record at the same time.

4.0 PERSONNEL DATA ENTRY

Personnel workyears data for a specific Lab and Function are entered in this section. A Lab and Function must be selected before proceeding (see Section 1.1).

An organization will have a number of personnel records. You can create one record for each employee, or you can put several similar employees on the same record. Each record identifies the Office, Employee Type, TDA Category, Position, and Series. In addition to government civilian and military employees, you are expected to create other personnel records to document the use of support contractor workyears which augment your in-house staff.

In each personnel record you will enter the full time, overtime, part time, and temporary workyears that you expect to be required. The sum of the workyears reported should equal the total number of workyears per year required to accomplish the mission of your organization. You will also enter a salary cost estimate on each record which is appropriate for that class of employee. The salary cost estimate will be scaled by the inflation factors and multiplied by the other estimating factors to produce an in-house cost estimate for "loaded Civilian Pay and Benefits (CPB)" for each year. The sum of the loaded CPB costs of all employees will be the estimate for the in-house costs for the organization.

Personnel								
Lab: CED	Function: BDGING		Office:					
Type: GOVT	TDA Cat: R		Position: S					
Series: 00318	- SECY TYPING				Skill: C			
Notes:								
	1993	1994	1995	1996	1997	1998	1999	2000
	-----	-----	-----	-----	-----	-----	-----	-----
Avg Salary (\$)	10000	10400	<- projected at inflation rate					
	-----	-----	-----	-----	-----	-----	-----	-----
Full Time:	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
Overtime:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Part Time:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Temporary:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	=====	=====	=====	=====	=====	=====	=====	=====
Total Wkys	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
	=====	=====	=====	=====	=====	=====	=====	=====
Loaded CPB (\$K)	26	27	29	30	31	37	33	34

As you can see in this discussion, the personnel are separately entered into the BPM. The BPM operates on the principle that personnel can be rapidly transitioned to work on

the revenues that are received. Therefore, there is a need to balance personnel costs against available revenues. This balancing is the main objective of the **Baseline Analysis Module**.

The remainder of this section describes the types of inputs that are expected in the personnel section. They are all accessed from the 'Edit' menu option.

4.1 Personnel ID Data

Selecting this item allows you to edit the identifying data for this personnel record. The fields to edit are the Office, Type, TDA Category, Position, Series, Notes, and Average Salary. These are individually defined below.

Office: This field should either be left blank or it should contain the office symbol of the part of the Lab to which these personnel belong. If it is not left blank, then the office symbol used must be already defined by the System Administrator in the offices file.

Type: This field identifies the employee type for this record. It must either be 'GOVT' for government employees, 'CONT' for support contractors, or 'MILP' for military personnel. If 'CONT' is selected, the fields TDA Category, Position, and Series will be left blank.

TDA Category: This field identifies the TDA Category appropriate for this employee record. In general, this corresponds to the type of funds from which the employee(s) are paid. A one-letter code is used. The choices are:

- R: For employees scheduled to be paid from RDTE funds (whether direct or reimbursable) or from reimbursable funds.
- O: For employees scheduled to be paid from OMA direct funds. These employees will not have the G&A surcharge applied.
- D: For employees scheduled to be paid from DBOF funds. These employees will not have the G&A surcharge applied.
- N: For employees whose salary we pay, but do not show up on the Belvoir TDA (such as AMC Interns).

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Position: This field contains a one-letter code to describe the position occupied by these employees. The choices available are D (Direct), M (Manager), S (Secy & Admin), and I (Indirect).

Note that these positions do not correspond exactly to the type of organization. For example, employees performing G&A work in a G&A organization are considered 'Direct'. All employees in an Indirect organization who are not Managers or Secretary/Admin are classified as 'Indirect'.

Series: You must select the Series or MOS that reflects the type of skills required for the reported workyears. The corresponding title and the skill code which appear when you select the series are those designated by OPM and cannot be edited. The System Administrator can modify the list of series, titles, and skill codes which can be used here.

Skill: The one-letter skill code for this record is determined by the series you select. The skill codes are: P (professional), A (administrative), T (technical), C (clerical), O (other), and M (military). You do not edit this field. It is determined by the series you select.

Notes: Use this field for whatever purpose you want. It is there to help remind you what employees are covered by this personnel record.

Average Salary: There are two salary figures that you enter here in whole \$. The first is the average salary for the execution (base) year for the employees represented by this personnel record. It is distinguished from the second salary figure (which is the average salary for the budget year) so that you can exactly match the base year expense and still average out the future years. The second salary figure will be inflated using the inflation factors for the POM years.

When the personnel record is first created, the program will automatically fill in the budget year salary as soon as you enter in an execution year salary. The program uses the inflation factor for the budget year to compute the second salary figure. You may use this computed average salary or enter in any other figure you wish. If you later edit the budget year salary, the program will not recompute the execution year salary and overwrite your data.

Salaries for military personnel should be left at zero until such time as Belvoir R&D/OMA funds are used to pay for military salaries. Currently, military personnel salaries are paid out of MPA accounts which are not covered in the BPM.

Note that where the personnel type is 'CONT' for contractors, you should enter the fully loaded contractor workyear cost (not just contractor salaries) into these fields. They will be inflated for the POM, but not multiplied by any of the other cost factors.

Note also that the average salaries shown here are the **only** cost figures entered in the model in **whole dollars**. All other costs and revenues in the model are entered and displayed in \$K.

4.2 Full Time Workyears

These fields should contain the number of full time government workyears planned each year for the group of employees represented by the personnel record. For a given Lab/Function, the sum of all of the planned full time workyears should equal a whole number, unless full time government personnel will be shared between Functions. The sum of the full time, overtime, part time, temporary, and contractor workyears reported should equal the total number of workyears per year required to accomplish the mission.

Personnel records identified as Contractors, Managers, or Military will only be allowed to enter full time workyears. Other types of workyears are not allowed for these records.

4.3 Overtime Workyears

These fields should contain the number of workyears of government overtime planned each year for the group of employees represented by the personnel record. This number should include paid overtime and compensatory time.

Overtime workyears are costed at 1.5 times the salary rate up to a limit salary cost. The limit salary cost for overtime is entered by the System Administrator.

4.4 Part Time Workyears

These fields should contain the number of part time government workyears planned each year for the group of employees represented by the personnel record. Each entry should reflect the number of part time workyears, not the number of part time personnel. For example, if two part time people each work 1/2 workyear in a year, the value reported for this case should be 1 part time workyear, not 2.

4.5 Temporary Workyears

These fields should contain the number of temporary government workyears planned each year for the group of employees represented by the personnel record. Contract students should be included as temporary workyears since that will result in the most accurate count of spaces against the TDA.

5.0 CAPITAL INVESTMENTS

Capital Investment data for a specific Lab and Function are entered in this section. A Lab and Function must be selected before proceeding (see Section 1.1).

The Capital Investments entered here are only those which are not directly chargeable to a specific revenue source. Investments which are chargeable should be reported under their revenues as 'Major Capital Investments'.

These are general investments which will be funded out of general operating funds. It is assumed that since they are required to support the Function's general mission, they will be replaced at the end of their useful life. Therefore, the replacement cost should be considered for all items entered, both new and current assets.

The Capital Investment window is displayed below:

Capital Investments								
Lab: CED	Function: BDGING	Office:	Priority: 0					
Asset Type: LAB EQUIP	Asset: ELECTRONIC INSTRUMENTATION							
Current Asset Value (\$K): 464	Depreciation Period (Yrs): 15							
(\$K)	1993	1994	1995	1996	1997	1998	1999	2000
Comp Repl:	31	32	33	34	36	37	49	50
Actual Repl:	31	32	33	34	36	37	49	50
New Invest:	0	0	0	0	0	155	0	0
	=====	=====	=====	=====	=====	=====	=====	=====
Total:	31	32	33	34	36	192	49	50
Benefits: REPLACE AGING EQUIPMENT								

As you will note, the program computes the replacement cost for the capital assets which takes into account the current asset value, the depreciation period, any new investments, and the inflation rate. You are allowed to enter any replacement cost you wish, but you can use the computed costs by selecting 'Post' from the top line menu.

The total of the Capital Investments entered here for a Lab/Function is used to automatically compute the capital investment factor for that Function. This is done in the 'Recalc' option of the Baseline Analysis. At that point, the costs of capital investments becomes a part of the Loaded CPB totals.

You should enter as many capital investment records as you need to include and characterize all of your existing capital assets and planned investments. However, be careful not to double count them.

5.1 Edit

The following fields are entered in the edit mode:

Office: This field should either be left blank or it should contain the office symbol of the part of the Lab which controls this capital asset. If it is not left blank, then the office symbol used must be already defined by the System Administrator in the offices file.

Priority: Enter the priority for this capital investment among the competing capital investments. There is no requirement to match this priority up with the priorities entered in Major Capital Investments in the Revenue section. This priority is particularly important in the BPRR (Budget and Program Resource Review) process.

Asset Type: This field must contain the type of asset in which the investment is planned. The asset types include: ADP (Automatic Data Processing equipment such as computers and peripherals); A/V (Audio/Visual Equipment such as projectors, televisions, and VCRs); LAB EQUIP; TEST EQUIP; VEHICLES; FACILITIES; FURNITURE; and OTHER. Select OTHER only if no other specific category is applicable.

Asset: This field must identify specifically what item(s) are being purchased (example: 6 widget testers). A separate Capital Investment record should be created for each group of items with a different asset identification. Do not leave this field blank.

Current Asset Value: This field should include the non-depreciated replacement cost in \$K for all of the current assets for the specified asset type. Only those current assets you are planning on replacing at the end of their useful life should be included in this value. Do not double count your current asset value if you enter multiple records of the same asset type and description.

Depreciation Period: This field should contain a value that represents the average number of years from asset purchase to the end of the asset's useful life. As a guideline, this value should be: 4 years for ADP; 8 years for A/V,

test equipment, and lab equipment; 10 years for vehicles; 15 years for furniture and facilities. If you select OTHER, you must enter a depreciation period appropriate for the specific asset. You may choose to deviate from the recommended guidelines for specific assets that have a depreciation period that significantly differs from the guideline value for that category of capital investment.

Actual Replacement: The program automatically calculates the per year replacement costs and presents this to you on the line called 'Computed Replacement'. This is the money required each year to replace obsolete equipment, based upon the current asset value, the depreciation period, the new investments, and the inflation factors. However, you may enter any replacement expenses you think are appropriate. These costs are entered in \$K. (See the discussion of 'Post' below to use the computed replacement costs).

New Investment: These fields should include estimates for the amount of money (in \$K) required each year to purchase the new assets identified. If the new investment is made to upgrade current assets make sure that the value entered is only the difference between the cost of the new assets and the replacement costs of the assets being displaced. New investment costs should not be reported if the plan is to simply replace existing assets.

Benefits: This field should include a brief but specific reason for investing funds for the purchase of the specified new investment assets. The benefit should capture the essence of the need or deficiency driving the capital investment.

5.2 *Post*

This menu option allows you to post the computed replacement costs into the actual replacement cost fields, without you having to type them in. The computed replacement cost considers the current asset value, the depreciation period, and the inflation factors. When new investments are entered, the computed cost also schedules the replacement of the new assets beginning in the year subsequent to acquiring the new asset, again using the depreciation period and the inflation factors.

The Post option works immediately when it is executed, using the current computed replacement costs. Therefore, you may need to post a second time if you change any of the new investment data.

6.0 CORE CAPABILITIES

The Core Capabilities are the twenty two (22) standard categories defined by AMC for measuring the general types of work done. Core Capabilities are entered for each Lab and Function and type of Revenue. Each Lab and Function should estimate the percentages of their staff workyears and externals which are devoted to each of the 22 core capabilities. These percentages should total to 100%.

Core Capabilities											
Lab: CED			Function: BDGING			APPN: DBOF					
	(%)	CIV	MIL	OGA	CON		(%)	CIV	MIL	OGA	CON
1. Prog/Proj Mgmt	5	100	5	5		12. Tech Testing	5	0	5	5	
2. Des/Dev/Engr	30	0	30	30		13. Sys Assessment	20	0	20	20	
3. Simulation	10	0	10	10		14. Upn Sys Field	0	0	0	0	
4. Tech Dev/Ins	30	0	30	30		15. Commodity Mgmt	0	0	0	0	
5. Manufact Tech	0	0	0	0		16. Maintenance	0	0	0	0	
6. Prod Engr	0	0	0	0		17. Logistics Mgmt	0	0	0	0	
7. Security Asst	0	0	0	0		18. Log Field Supt	0	0	0	0	
8. De-Mil	0	0	0	0		19. Contracting	0	0	0	0	
9. Productn Base	0	0	0	0		20. Info Mgmt	0	0	0	0	
10. Ind Base Mgmt	0	0	0	0		21. HQ Mgmt	0	0	0	0	
11. Mob/Cont Supt	0	0	0	0		22. Base Support	0	0	0	0	
Totals (%)							100	100	100	100	

As you can see, there are four columns of percentages. These are:

CIV: The percentage of civilian government employee workyears (all types) devoted to this core capability.

MIL: The percentage of military workyears (full time only) devoted to this core capability.

OGA: The percentage of Other Government Agency externals (funds) devoted to this core capability.

CON: The percentage of other contract externals (funds) devoted to this core capability. Both the T&M support contracts and the major contracts are included here.

When you enter this section, you select a Lab and Function in the same manner as in the other four data entry areas (see Section 1.1 for details). The program then scans the revenue file and determines what appropriation types are pertinent to this Lab/Function. Only the pertinent appropriation types will be offered for you to enter data into. You can use 'Goto' or the [Page Up] and [Page Down] keys to display the other appropriations.

6.1 Edit

There are twenty-two core capabilities with four percentages each that can be entered in this section. These fields should include values representing the percentage of the planned workyears or funds that are expended in the specified core capability. The sum of the percentages in each column should equal 100%. To edit a core capability, highlight the desired line and press [Enter] to select it for editing.

The 22 Core Capabilities, and their brief descriptions, are:

- (1) **Program/Project/Product Management:** Management and oversight of all those activities required to successfully execute an assigned program.
 - Co-Production Management. Developing and managing agreements with foreign countries on the terms and conditions for foreign manufacture of a U.S. Army system/item.
 - Materiel and Combat Developer Integration. Management of the process to integrate user requirements with a technical solution.
 - Acquisition of Systems and Equipment. The management of hardware, software, materiel, facilities, personnel, data and services needed to perform a designated function with specified results.
 - Program Security. Identification and management of classified and unclassified information and associated release.
- (2) **System Design/Development/Engineering & Integration:** The life cycle technical activities relating to weapon systems.
 - Concurrent Engineering. A systematic approach to the integrated, concurrent design of products and their related processes, including manufacture and support.
 - Engineering Data Management. Technical and administrative direction and surveillance actions taken to identify and document technical information associated with an item.
 - Producibility Engineering. Applies to production engineering tasks to ensure a smooth engineering transition from development into production.
 - Specifications and Standards. Acceptance procedures including the criteria for judging whether the requirements have been met.

- Systems Interoperability. The ability of systems to accept services from other systems and operate effectively together.
- (3) **System Simulation & Modeling:** Methodology used to understand, predict or improve actual or conceptual system performance.
 - Part/Component/Materiel/System and Scenario Simulation and Modeling. Process of conducting experiments with a model for the purpose of understanding the behavior of the system modeled under selected conditions.
 - Blue/Red Representation. Models used to represent threat weapon systems in development testing, operational testing, and training.
- (4) **Technology Development & Insertion:** Identification, evaluation and implementation of technology solutions in support of national imperatives.
 - Management of Basic Research, Applied Research Management. Management and execution of 6.1 programs.
 - Exploratory Development, Management and Execution. Management and execution of 6.2 programs.
 - Foreign Technology Exploitation. Acquisition of foreign developed hardware or software for evaluation against user needs.
 - Technology Adaptation/Development/Integration/Transition. Evaluation and analysis of technology for application/adaptation towards satisfying user needs by materiel solutions.
 - Technology Demonstration Management. Evaluate technology alternatives to provide basis for determining whether to proceed into engineering and manufacturing development.
- (5) **System & Materiel Manufacturing Technology:** Demonstrate and apply new or improved technology in production.
 - Environmental Pollution Prevention. Preventative actions taken to preclude adverse effects on the environment.
 - Explosive Safety Technology. Actions taken to assure the inadvertent detonation of explosives during the life cycle.
 - Manufacturing Technology. Manufacturing process techniques or equipment required to support current or projected programs.
 - Prototyping. A methodology to identify and resolve specific design or manufacturing risks.
- (6) **Production & Post Production Engineering Support:** Application, design, development and engineering techniques for production.
 - Manufacturing and Producibility Engineering. Application of design and analysis techniques to economically produce a specified product.
 - Product Assurance. Program to assure performance meets specified

- requirements.
- Validation of Tech Data. Assures the engineering data reflects the manufactured system.
- (7) **Security Assistance:** Materiel and services provided by the U.S. to eligible allies as specified by Congress.
 - Country Program Management. Management of the country's purchases from the U.S. Army from the total package offer (Letters of Offer and Acceptance) through follow-on support which ensures that certain countries receive fully integrated and operative weapon systems.
 - Export License Evaluation. Process for determining whether technology is releasable to a foreign government.
 - FMS Program/Case Execution. Managing the sale and reimbursement of U.S. Army materiel and service to a foreign government.
- (8) **De-Militarization:** Elimination of the military capability of specific materiel.
 - Equipment Reuse and Support. Actions taken to utilize previously used materiel.
 - Processing and Disposal. Destruction of equipment or materiel.
 - De-Mil Engineering. Identification and determination of procedures to eliminate specific military capabilities.
- (9) **Organic Production Base:** Production, manufacturing and fabrication capabilities.
 - Component or End Item Assembly. In-house capability to assemble parts into components or end items.
 - Contingency Depot. Ability to increase the supply and maintenance capability at selected geographical locations.
 - Manufacturing and Fabrication. In-house capability to produce parts and components.
- (10) **Industrial Base Management:** Assessing and ensuring adequate industrial facilities to meet military needs.
 - Industrial Preparedness. The state of preparedness in industry to produce essential materiel to support the national military objectives.
 - Capability/Utilization Planning. Strategy to assure needed production capability exists when and where required.
 - Industrial Facilitization for Emerging Technologies. Assure production processes will be in place when needed to produce systems utilizing emerging state-of-the-art technologies.
- (11) **Mobilization & Contingency Support:** Efforts which can be made available to meet foreseeable war time or emergency needs.

- Command Mobilization Contingency Planning. Integrated plan to ensure AMC has the capability to support the combat commander during military operations.
 - Emergency Operations. Provide personnel, equipment, supplies and services necessary to meet national security objectives, disaster relief, and civil defense.
 - Mobilization and Surge Assessments. Determine manufacturing capability to increase production on demand.
 - Facilitate Reserve Component Training. Programs to ensure requisite facilities, tools and equipment are available to establish a realistic training environment.
- (12) **Technical Testing:** Means employed to evaluate and prove engineering, safety, producibility and transportability aspects of systems and components.
- Test Management. Planning, integration and oversight to assure timely availability of required resources and documentation to accomplish test objectives.
 - Test Execution. Test performance and documentation.
 - Test Technology Development. Development of test instrumentation to permit evaluation/testing of state of the art systems and components.
- (13) **System Assessment & Evaluation:** Reviews and evaluations required to assure the effectiveness of acquired systems.
- Functional Area Assessments. Intensive management forum to identify and resolve issues which inhibit the execution of plans and programs and to optimize the Army structure.
 - Independent Assessment and Evaluation Planning/Reporting. Independent review of a system's capabilities and functional effectiveness against established requirements.
- (14) **Weapons/Battlefield Systems Fielding:** The act of deploying to the field (both U.S. and allies).
- Materiel Fielding to Include Foreign Country Activities. The process of planning, coordinating and executing the deployment of a materiel system and its support.
 - New Equipment Training. The identification of personnel, training, training aids and devices, and the transfer of knowledge from the Materiel Developer to the trainer, user, and maintainer of new Army equipment.
 - Surety Processes. Those controls, procedures, and actions which contribute to the safety, security, reliability and survivability of chemical and nuclear weapons and materiels.
- (15) **Commodity Management:** The management of equipment and materiel into supply systems.
- Cataloging/Provisioning. (Cataloging) Classifying, naming, describing and numbering all items of supply in a systematic and uniform way. (Provisioning)

- Management process of determining and acquiring the range and quantity of support items necessary to operate and maintain an end item of materiel for an initial period of service.
- Distribution and Execution Single Manager for Conventional Ammunition. Focal point for DoD conventional ammunition.
 - Distribution/Transportation/Packaging. (Distribution) Includes monitoring, coordinating and affecting the centralized processing of requisitions and returns for worldwide customers. (Transportation) Movement and control of materiel. (Packaging) The development, maintenance and dissemination of adequate preservation, packing and marking requirements for assigned materiel.
 - Inventory Management. The control of materiel from initiation of procurement to disposal to include worldwide quantitative and monetary inventory data and positioning and repositioning of materiel.
 - Management of War Reserve and Prepositioned Stock. The management (receipt, storage, care, inventory and issue) of non-perishable materials with long lead time for production that are needed to sustain the force at times of conflict.
- (16) **Maintenance:** The acts of restoring or replacing parts/components to achieve standard service levels.
- Depot Support Maintenance Operations. Maintenance performed on materiel requiring major overhaul or complete rebuild of parts, assemblies, subassemblies, and end items. Provides support utilizing more extensive shop facilities, equipment and technical skills than found at lower echelons of maintenance.
 - Develop Maintenance Related Input to Acquisition Cycle Process. Ensuring that an acquired item can be maintained in accordance with the maintenance concept.
 - Maintenance and Renovation of Ammunition. The process of caring for and rendering of ammunition to a like new condition.
 - Maintenance Engineering. Activity of equipment maintenance which develops concepts, criteria and technical requirements to assure timely, adequate and economic maintenance support of weapons and equipment.
 - Post Deployment Software Support (PDSS). The development, replication and distribution of refinements and enhancements to existing software that is an integral part of the fielded system.
- (17) **Logistics Management:** Considerations of logistics support aspects for a system in the context of that system's role in the force structure.
- Integrated Logistics Support. The management and technical activities necessary to integrate support considerations into system and equipment design; develop support requirements that are related consistently to readiness objectives, to design, and to each other.
 - Logistics Data Management and Publications. The management of logistics data which forms the basis for decision making related to all aspects of the weapon

- system life cycle and the publication of the applicable documentation.
 - Logistics Engineering. Design and evaluation of the system's support concept.
- (18) **Logistics Field Support:** Support to the customer.
- DoD Explosive Safety Technical Support. Actions and processes required to ensure adequate safety measures are employed when volatile materials are utilized.
 - Field Technical Assistance. To provide technical support to the field to include responding to field inquiries, "over the shoulder assistance," malfunction investigation, and red-team activities.
 - Logistics Assistance. Assistance to the user in obtaining (identify, locate, and expedite) the parts required.
- (19) **Contracting:** Activities associated with the development, execution and management of a contract.
- Acquisition Planning. Documents and defines the acquisition approach (competition strategy, industrial base considerations, small and disadvantaged business considerations, market surveys, etc.).
 - Solicitation Development. Integration of functional requirements into a comprehensive business document.
 - Contract Execution. Activities involved in the receipt and evaluation of contractor offers/bids and other considerations leading to the award of a contractual document.
 - Contract Management. Activities related to post contract award (contract administration, monitor program, oversee payments, record delivery, modifications, close-out contracts).
- (20) **Information Management:** The management of activities related to information management equipment and services.
- Automation. Conversion of a procedure, a process, or equipment to automated collection, storage and retrieval of data.
 - Communications. Method or means of conveying information of any kind from one person or place to another.
 - Printing and Publication. The processes of composition, platemaking, presswork, and binding for the production of items that are printed or reproduced.
 - Records Management. A program that includes elements concerned with the life cycle management of information, regardless of media.
 - Technical Libraries. An activity that acquires, organizes, retrieves, and disseminates information and information materials and performs reference and research in support of the command and mission.

- (21) **Headquarters Management:** Encompasses all activities shown at Level 2 (Command & Control, Planning, Policy, resource Allocation, Integration, Evaluation, and Marketing).
- Command and Control. Means and methods of communication and decision-making processes at the highest command levels (Commanders, Deputy Commanders, Principal Deputies, Chief of Staff, and heads of separate reporting activities).
 - Planning. Identifying and arranging actions to achieve desired objectives/goals.
 - Policy. Formal guidance for implementation of required actions.
 - Resource Allocation. All activities involving force structure and management and the financial aspect of AMC operations, to include all appropriations and funds in all phases of the PPBES.
 - Integration. The process of bringing together separate actions to optimize courses of action.
 - Evaluation. Review and analysis.
 - Marketing. Generation of customers and support while maintaining/creating a positive image for the command.
- (22) **Base Support:** Activities required to operate and maintain an installation, including administration, facilities, transportation, physical security, community relations, etc.
- Administration Activities. (Includes finance, chaplain, base operations support in contracting, personnel, transportation, etc.).
 - Community Activities. Activities in direct support of Morale, Welfare and Recreation programs.
 - Engineering, Housing and Facilities. Activities in direct support of the buildings and common areas associated with the command and its military housing and other facilities.
 - Installation Services. Activities such as cleaners, laundry, bank, commissary, etc.
 - Physical Security. Activities in direct support with the physical protection of personnel, installations, and material associated with the operation of a facility.

6.2 List

The Core Capabilities section has two specialized reports:

Core Cap Dollars: This report lists the revenues of a Lab/Function as they are allocated to each of the 22 core capabilities. The revenues are divided into the three categories of expense: in-house, OGA, and contract costs.

You are asked to choose which part(s) of the core capability data to use. The screen shown below pops up to show you the currently selected Lab, Function, Appropriation, and the Execution Year.

FILTER OPTIONS	
FIELD	FILTER
-----	-----
LAB:	CED
FUNCTION:	BDGING
APPN:	DBOF
Year:	1993

You may enter in any other Lab, Function, or Appropriation. Or you may leave one or all of them blank to get the totals for a group of data. For example, to get all revenues for CED, you would leave the Function and APPN fields blank. To get all DBOF revenues throughout the Center, you would leave the Lab and Function fields blank.

You cannot leave the Year field blank. The program must know what year's revenue data to total.

Core Cap QC Report: This report verifies that each Lab/Function has provided 100% coverage of the core capabilities for each of its revenue types in each of the four columns of the screen. This report will scan all the organizations in the database, and print one line for each Lab/Function/APPN showing the percent coverage of core capabilities in each of the four categories (CIV, MIL, OGA, and CON).

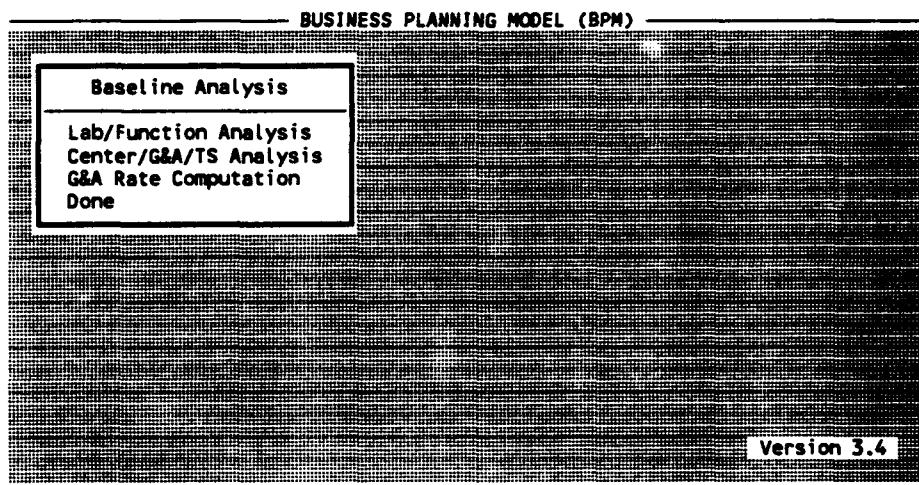
***BASELINE ANALYSIS
MODULE***

1.0 INTRODUCTION

The Baseline Analysis Module contains screens and reports which summarize the data as it has been entered into the Data Entry Module (the 'baseline' data). The analyses allow you to view the balances and totals for each Function, for each Lab, and for the Center as a whole. In addition, you can see the aggregate G&A and Tech Support activities of the Center.

This module also analyzes the baseline G&A costs and the baseline revenues to determine what the actual G&A rate should be to exactly cover the G&A costs which are not covered by external G&A revenues.

The main submenu for the Baseline Analyses is shown below:



The first two menu choices lead you into very similar screens. The only difference is the level of analysis that is provided, and the specialized reports which are offered. In this User's Guide, these two choices are described together in paragraph 2.0 to avoid repetition. The third choice is a distinct analysis and is presented in paragraph 3.0.

2.0 LAB/FUNCTION and CENTER/G&A/TS ANALYSES

There are a number of similarities between the Lab/Function Analysis and the Center/G&A/TS Analysis sections. They are combined together in this one section to avoid repetition. Where there are differences between the two, they are pointed out for your understanding.

The principal difference is the level of analysis. The Lab/Function level displays analysis results for a single Function and for its Lab. You have to choose which Lab and Function you wish to analyze. The Center/G&A/TS level displays analysis results for the Center as a whole, and for aggregate G&A and aggregate Tech Support Functions across the Center.

2.1 Baseline Analysis Screen

The layout of the baseline analysis screen is the same for all levels of analysis. In general, the window shows you the totals and balances between the revenues and costs you entered in the Data Entry Module. There are some differences, however, of which you should be aware.

Lab: CED	Function: BDGING		FCN Totals					
	1993	1994	1995	1996	1997	1998	1999	2000
(\$K)								
Govt Wkys	21.0	21.0	21.0	13.3	21.0	21.0	21.0	21.0
Loaded CPB	755	762	794	518	845	1029	914	945
Externals	6671	5476	3786	1558	3239	3194	3863	3615
Internals	40	40	80	80	80	40	40	40
G&A	36	211	323	172	394	437	503	555
Total Cost	7502	6489	4983	2328	4558	4700	5320	5155
External Rev	7843	6592	5103	2718	4427	4404	4953	4758
Internal Rev	654	775	644	898	941	1149	1186	1221
Net Carry	-10	10	15	5	0	0	0	0
Tot Revenue	8487	7377	5762	3621	5368	5553	6139	5979
Difference	985	888	779	1293	810	853	819	824

The sample screen shown above displays summary data for a Function. You can tell this because of the 'FCN Totals' label on the upper right of the window border, and because the Lab and Function being analyzed are named on the first line inside the window as a

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report header. The possible combinations of report headers and labels are as follows:

<u>Report Header</u>		<u>Border Label</u>
Lab: XXXX Function: XXXXXX	-	FCN Totals
Lab: XXXX	-	LAB Totals
R&D Center Totals	-	CTR Totals
Center G&A Totals	-	G&A Totals
Center TS Totals	-	TS Totals

As you can see, the screen displays rows of numbers, which are tabulated by year. Each of the eight years of the planning horizon is shown. Costs are shown above revenues and their differences are computed. All financial data are in \$K. The elements of cost are:

Govt Wkys: These are the total government workyears (civilian and military; full time, part time, overtime, and temporary) reported by the organization being analyzed. Non-TDA organization workyears do not appear in the Center, G&A, or TS totals. This line is expanded upon in the 'Details', 'Workyear Totals' screen (see paragraph 2.3.6 below).

Loaded CPB: These are the costs per year of the civilian pay and benefits, and all the associated personnel-related costs which are computed using the estimating factors. Non-TDA organization loaded CPB costs are not included in this line in the Center, G&A, or TS totals. Instead, they are counted as an external cost. This line is expanded upon in the 'Details', 'Loaded CPB Totals' screen (see paragraph 2.3.1 below).

Externals: These are the costs per year of all external actions. These include the major externals, the support contractors, and the major capital investments. In addition, the Center, G&A, and TS totals include the costs of non-TDA organizations as externals. This line is expanded upon in the 'Details', 'External Expenses Totals' screen (see paragraph 2.3.2 below).

Internals: These are the total scheduled internal transfers out of the organization. At the Function, Lab, G&A and TS levels, this is simply the sum of all transfers out of the organization (i.e., transfers within the Lab or Function are screened out). At the Center level, these values will be zero. There is no such thing as an internal transfer out of the Center (that is an external cost by definition). This line is expanded upon in the 'Details', 'Internal Transfer Totals' screen (see paragraph 2.3.5 below).

G&A: These are the yearly totals of the G&A surcharge that is paid by the

organization, assuming its revenues. These values will be zero at the Center level because the Center does not pay a G&A surcharge. That is, the surcharge is just an internal accounting device. At the Center level, the actual costs of the G&A Functions are shown under Loaded CPB and Externals. The values for the G&A and TS levels will also be zero because these organizations do not pay the G&A surcharge.

Total Cost: These are the sum of the four cost elements just described.

The next three lines describe the revenues that are scheduled to be received by the organization. Depending upon the type of organization and level of analysis, the line labeled 'Net Carry' in the example will have a different title and definition, as described below.

External Rev: These are the revenues which come to the organization from external sources. These are the sum of all revenues reported in the Revenue Data Entry section except those which are categorized as Internal Transfers.

Internal Rev: These are the revenues which come to the organization from internal sources within the Center. These are the sum of all revenues reported in the Revenue Data Entry section which are categorized as Internal. Since these are anticipated revenues rather than actual ones, there is the possibility that what one Function reports as revenue will not match what another Function reports as an expense. This line is expanded upon in the 'Details', 'Internal Transfer Totals' screen (see paragraph 2.3.5 below).

Net Carry: These are the total net impact of carryover for each year. If the value is positive, then the organization carried over more funds into this year than it carried out to the next year. If it is negative, then it carried out more than it carried into the year. For certain organizations and levels of analysis, this line is replaced by one of the following three lines.

Ind Pool Rev: This replaces the net carry line only for Laboratory Indirect Functions. This displays the sum of the pooled Lab Indirect revenues which are generated by the appropriate indirect factors being applied within the other Functions of this Lab. This should be the principal source of funding for the Lab Indirect Functions.

TS Pool Rev: This replaces the net carry line only for Tech Support Functions, in Labs which contain Tech Support Functions, and on the Center TS totals screens. This displays the sum of the pooled tech support revenues which

are generated by the appropriate tech support estimating factors being applied within the other Labs and Functions. This pooled revenue, and internal transfers, should be the principal sources of funding for the Tech Support organizations.

G&A Pool Rev: This replaces the net carry line only on the Center G&A totals screen. This displays the sum of the pooled G&A surcharges which are generated by the G&A rate being applied within the other Labs and Functions. The G&A pooled revenue supplements the G&A external revenue to pay for the G&A costs of the Center.

Tot Revenue: This is the sum of the three revenue lines displayed above it. If net carryover applies, but is not displayed because one of the other three lines is shown, then it is also added into the total.

Finally, the Difference is displayed. This is the difference between Total Revenues and Total Costs. If the difference is positive, then the organization is receiving more than it is spending (making a profit). If the difference is negative, then the organization is operating at a loss.

The top-line menu is exactly the same for all the Lab/Function and Center/G&A/TS screens except that the Center/G&A/TS Analysis does not contain a 'Factors' option. The top-line menu options are described below.

2.2 Toggle

The 'Toggle' option is used to switch the level of analysis. In the Lab/Function Analysis, you can switch between looking at the Function that you selected when you entered the module and its Lab. To switch to a different Function within the Lab, you must quit and reenter to select the other function.

In the Center/G&A/TS Analysis, you can switch between any of the three Center-wide analyses, or any of the four individual Tech Support Functions.

2.3 Details

The 'Details' selection lets you see more detailed information concerning the baseline analysis data. You would use it to diagnose problem areas and to help you understand the details behind the totals which are presented on the main analysis screen.

When you select 'Details' a pull-down submenu will appear. Each of the choices on the pull-down submenu will open another window which provides greater detail. Again, some of the details will depend upon the level of analysis. These windows are separately described in the paragraphs below.

2.3.1 *Loaded CPB Totals*

These are the components of the total "loaded" costs for government personnel. They include salary, benefits, awards, travel & transportation, materials & supplies, training, regular capital investments, the four categories of tech support, and the contribution to the laboratory indirect pool. It does not include the G&A surcharge which is applied to labor.

	1993	1994	1995	1996	1997	1998	1999	2000
(\$K)								
Salary	515	519	537	342	575	595	615	636
Benefits	69	69	72	45	77	79	82	85
Awards	0	0	0	0	0	0	0	0
Tvl & Trans	25	26	27	17	28	29	30	31
Matl & Supp	6	6	7	4	7	7	8	8
Training	6	6	7	4	7	7	8	8
Reg Cap Inv	39	41	47	43	46	202	59	61
ILS Tech Supt	10	10	10	6	11	11	11	12
IMO Tech Supt	3	3	3	2	4	4	4	4
PAE Tech Supt	19	19	20	13	21	22	23	24
FSD Tech Supt	6	6	7	4	7	7	8	8
Indirect	56	56	58	37	62	64	67	69
	=====	=====	=====	=====	=====	=====	=====	=====
Loaded CPB	755	762	794	518	845	1029	914	945

This screen has two interesting components which depend on the level of analysis:

- (1) The four tech support lines will be zero for the Center analysis screen. This is because the actual total tech support costs will be included in the analysis rather than the total contributions to their pooled revenue.
- (2) The Indirect cost line will be zero at the Lab level and higher for the same reason. Starting at the Lab level, the actual total indirect cost will be included in the analysis rather than the total contributions to their pooled revenue.

2.3.2 External Expense Totals

This screen breaks out the external expenses into the three components of major externals, major capital investments, and support contracts as they were reported in the Revenue Data Entry section.

	FCM Externals							
(\$K)	1993	1994	1995	1996	1997	1998	1999	2000
Major External	6357	5084	3532	1378	2985	2922	3640	3330
Cap Investment	0	24	0	0	0	0	0	0
Supt Contracts	314	368	254	180	254	272	223	285
Non-TDA Orgs	0	0	0	0	0	0	0	0
Totals	6671	5476	3786	1558	3239	3194	3863	3615

In addition, another line is added to capture the costs of non-TDA organizations. At the Function and Lab levels, this line is zero. At the Center, G&A, and TS level, this line shows the costs of non-TDA organizations which are properly classified as external costs to the Center.

2.3.3 Support Contractor Totals

This window displays the costs associated with support contractors. This information comes from both the personnel and the revenue files. The revenue file provides the total support contractor costs (both labor and material), while the personnel file only provides the labor costs. From this, the cost of materials is inferred.

	FCM Support Cont							
(\$K)	1993	1994	1995	1996	1997	1998	1999	2000
From Revenue:								
Total Cost	314	368	254	180	254	272	223	285
From Personnel:								
WorkYears	2.9	3.4	3.0	1.7	2.4	2.6	1.8	2.6
Labor Cost	89	106	96	58	82	94	66	98
Matls Cost	225	262	158	122	172	178	157	187

2.3.4 Capital Investment Totals

This window displays together the two kinds of capital investments. These are the regular investments entered in the Capital Investments Data Entry screen (which are split into replacement costs and new investments), and the Major Capital Investments entered into the Revenue section.

FCN Cap Invest								
(\$K)	1993	1994	1995	1996	1997	1998	1999	2000
From Cap Inv:								
Replacement	39	41	42	43	46	47	59	61
New Invest	0	0	5	0	0	155	0	0
From Revenue:								
Maj Cap Inv	0	24	0	0	0	0	0	0
Totals	39	65	47	43	46	202	59	61

The totals are provided for your information only. They are not represented as a single line on the main analysis screen. The regular investments are included in the Loaded CPB totals and the major capital investments are included in the Externals.

2.3.5 Internal Transfer Totals

This Internal Transfers Totals window displays three sets of internal transfer numbers as shown below.

FCN Internal Transfers								
(\$K)	1993	1994	1995	1996	1997	1998	1999	2000
Expenses:								
Total	40	40	80	80	80	40	40	40
Local (-)	0	0	0	0	0	0	0	0
Net	40	40	80	80	80	40	40	40
Anticipated Revenue:								
Total	654	775	644	898	941	1149	1186	1221
Local (-)	0	0	0	0	0	0	0	0
Net	654	775	644	898	941	1149	1186	1221
Actual Revenue:								
Total	100	100	100	100	100	100	100	100
Local (-)	0	0	0	0	0	0	0	0
Net	100	100	100	100	100	100	100	100
Act-Ant Rev:	-554	-675	-544	-798	-841	-1049	-1086	-1121

These three are required because of the need to balance expected internal transfer revenues against actual internal transfer costs. The **Expenses** are those transfers identified as leaving this organization which have been reported in the Revenue section. The **Anticipated Revenues** are the incoming internal transfer revenues taken from those revenue records which have been marked with a group type of INTERN. The **Actual Revenues** come from internal transfer expenses which have been identified as going into this organization by other Labs and Functions. The **Local (-)** amounts are the actual internal transfers occurring within the organization being analyzed (for example from one Function to another within this Lab). They are subtracted from each of the totals to report just the net expenses and revenues.

The significant thing about this is that there could be a difference between what an organization expects to receive and what other organizations expect to give. This difference is captured on the final line 'Actual - Anticipated Revenue'. A negative number indicates that the organization has been over-optimistic in its expectations of internal transfers.

2.3.6 Workyear Totals

This window displays the workyear totals. The top six lines are the components of the 'Government Wkys' shown on the main analysis screen. The line labeled 'Contractor' displays the workyears for T&M support contractors only. They represent an augmentation to the government workforce.

Other Non-TDA workyears will only be included in the Center, G&A, and TS analysis screens (where they represent the total workyears for non-TDA organizations). The non-TDA workyears present in the TDA organizations (from AMC Interns, for example) are reported as 'Org Non-TDA'.

CTR Workyears								
(Wkys)	1993	1994	1995	1996	1997	1998	1999	2000
Full Time	569.8	571.9	568.4	342.8	567.2	567.8	567.2	566.2
Overtime	9.1	8.9	8.8	8.8	7.8	7.8	7.8	7.8
Part Time	3.8	5.0	5.9	5.9	5.9	5.9	5.9	3.8
Temporary	6.7	7.3	9.1	9.1	7.3	7.3	7.4	7.3
Org Non-TDA	2.4	2.4	2.4	1.4	2.4	2.4	2.4	2.4
Military	15.0	14.4	13.8	8.3	13.8	13.8	13.8	13.8
Contractor	135.8	145.6	117.3	112.3	109.5	102.1	97.4	95.6
Other Non-TDA	70.1	64.3	68.9	46.2	68.3	67.7	67.7	67.7
	=====	=====	=====	=====	=====	=====	=====	=====
Total	812.8	819.8	794.7	534.9	782.3	774.8	769.5	764.6

2.4 *Recalculation of Totals*

The recalculation of totals from the baseline data is critical. This step creates the totals which are displayed on the Baseline Analysis screens which have just been described. When you recalculate, a large number of totals (of revenues, costs, pooled revenues, and workyears) are made at once. This allows you to rapidly switch back and forth among the analysis levels without waiting for the computer to re-scan the baseline data at each screen. Instead, the totals are all produced at once, stored in a separate data file, and simply presented for your analysis.

When you change the baseline data, you must recalculate the totals. The file of totals is not automatically kept up to date as you enter data into the files. You must recalculate in order to have your changes to the baseline data reflected in the totals.

You recalculate by selecting 'Recalc' from the top-line menu. This can be a slow process, depending on how large your data files are and what kind of computer you are working with. Totals are accumulated for the Function, Lab, and Center, and also for aggregate G&A, Tech Support, and Indirect Functions.

The 'Recalc' option works differently in the Lab/Function Analysis compared with the Center Analysis screens. The Lab/Function 'Recalc' prepares totals for just the Lab being analyzed (and all of its Functions). You must recalculate from the Center Analysis screen if you want the Center totals. The differences are explained in detail below.

2.4.1 *Recalculation at the Lab/Function Analysis Screen*

The 'Recalc' option at this level is straightforward. You are only asked to confirm that you want to recalculate.

<p>Recalculate Totals for this Lab?</p> <p>No Yes</p>
--

The BPM then goes to your data files and scans them for records pertinent to this Lab. It works with one Function at a time, and then prepares the Lab totals. This will not affect the totals screen for the Center or for any other Lab.

At the conclusion of the recalculation, the totals screen is redrawn with the new totals.

If an error occurs during the recalculation, the totals will be incomplete and the screen may display all zeros. The principal reason for an error is insufficient memory.

The involved recalculation process is technically described in the Methodology Summary, Appendix C.

2.4.2 *Recalculation at the Center/G&A/TS Analysis Screen*

The recalculation at the Center level is conducted in two parts. The first part prepares the Lab totals (exactly as described above) for each of the Labs in turn. You would answer 'Yes' to the following prompt to have it begin the process:

First Recalculate the Lab Totals?

No Yes

This steps through each Lab in the Center and creates the Lab totals. This takes a while. You might want to bypass this step if: (1) You had recalculated the Lab totals before, but had then gone back and made some changes to the baseline data confined to one Lab, and (2) You have already recalculated the Lab totals for that Lab (in the Lab/Function Analysis section). Otherwise, you should answer 'Yes' and recalculate all the Lab totals here.

The second part of the recalculation process at this level produces the totals for the Center. This is the main part of this recalculation. You probably will always want to answer 'Yes' to the following prompt (unless you noticed a problem with the first part):

Recalculate Totals for the Center?

No Yes

This phase of the recalculation looks at the Lab and Function totals that were just created and prepares the totals for the Center. Again, this is a complex recalculation. A detailed explanation can be found in the Methodology Summary, Appendix C.

With these totals, the program is now ready to display any and all of the on-line analysis products, and to produce the printed reports.

2.5 List

The following are the many specialized reports from which you can select in the Baseline Analyses. The Totals reports are the same user defined reports available in the Data Entry Module, and which are described in Appendix A. Most of the specialized reports are accessed through the Center/G&A/TS Analysis screens.

2.5.1 Lab/Function Analysis Reports

Listing (Analysis): This report prints out the contents of the main (red) analysis screen, and each of the subordinate (purple) detail screens for this Lab or Function.

Internals Diagnosis: This report diagnoses the differences between actual and anticipated internal transfer revenues. This is a complete summary of the internal transfers pertinent to the Lab/Function being analyzed. It consists of five parts: (1) It duplicates the analysis totals presented on the Internal Transfers Detail screen, (2) It itemizes (by Lab/Function) the total amount of internal transfers to all other Labs/Functions from this organization, (3) It itemizes (by Lab/Function) the anticipated total amount of internal transfers from all other Labs/Functions to this organization, (4) It itemizes (by Lab/Function) the actual total amount of internal transfers from all other Labs/Functions to this organization, and (5) It itemizes (by Lab/Function) the total amount of internal transfers occurring within (local to) this organization.

2.5.2 Center/G&A/TS Analysis Reports

The analysis reports at the Center/G&A/TS level are much more extensive. Here is where you will find all of the reports needed to respond to the AMC-mandated business planning charts, as well as many others needed to support budgeting process. Several of the List Options are actually submenus of reports since there are so many.

Net Amounts by Organization: This report lists the net (revenue-expenses) amounts by Lab and Function, for each organization within the Center (including non-TDA organizations). In general, each organization should be in balance, that is, they should have net amounts of zero. This report is

useful in identifying the specific organizations which are most out of balance.

Exp Totals Reports

These are "sources and uses" reports showing how funds of each type are used for various types of expenses. These reports break out the revenue and expenses by direct/customer, appropriation type and category. The expense breakout includes salary, travel, training, materials & supplies, capital investments, etc. These reports are unique in that they allocate G&A, Indirect, and Tech Support costs to each of the expense categories by the source of the funds. Four reports are offered in a submenu.

Exp by Dir/Cust+Appn+Cat: This report sorts the revenues by Direct/Customer, by Appropriation, and by Category of funds. For each group of revenues it prints out the allocation of the revenue to the elements of expense. The expenses for G&A, Indirect, and Tech Support are further allocated to the basic expense types (i.e., salary, materials and supplies, etc.). After all the individual revenue groups are printed, the grand totals of expense by type are reported.

Exp by Appn+Cat: This report is exactly like the one above except that it sorts the revenues just by Appropriation and by Category of funds.

Tech Base IH/OH: This report uses the same methodology as the previous two reports to produce totals for just the Tech Base revenues and expenses so that the in-house/out-house ratios can be computed. Based on the revenues, it reports the total allocated in-house costs, the support contractors, and the major externals. Then, the report presents ratios of in-house to out-house costs and in-house costs to total Tech Base revenue. Note that the costs for Support Contractors have been included as an in-house cost according to SARDA definition.

Sources and Uses Report: This report exactly mimics the AMC-mandated Sources and Uses Report. It lists, for a specific year, the Center-wide allocation of in-house costs (manpower, operations, and investments) and externals (to other government agencies, industry, FFRDCs, universities, and other non-profit organizations) broken apart by mission and support. A separate table is produced for direct and reimbursable revenues, and they are totalled on a third table. There are many steps executed in preparing this report. The first is to specify the year to be reported on.

Report for Year	
Year	<input type="text"/>

The second step is to specify the factors for the 6.2 and 6.3a direct revenues which fill in the six FFRDC, universities, and other non-profit organizations columns of the report. The data to fill these six columns have no other means of being collected within the BPM, and traditionally, historical percentage factors have been used to estimate them based on the total amount of externals to industry. There are two windows of percentages to fill in, one for 6.2 direct and the other for 6.3a direct. Only these two revenue sources will have values in these six columns. For example, the first line asks what percentage of the total mission externals will go to FFRDC's.

Factors for 6.2 Direct	
% FFRDC Mission:	<input type="text"/>
% FFRDC Support:	<input type="text"/>
% Univ Mission:	<input type="text"/>
% Univ Support:	<input type="text"/>
% Other NP Mission:	<input type="text"/>
% Other NP Support:	<input type="text"/>

Then come some questions about how to do the calculations. The first asks if you want to include carryover in the calculation of revenue for the reporting year:

Include Carryover in Revenue Calculation?	
No	Yes

If you answer 'No', then just the new external revenue is included in the calculation. The second question asks if you want to round the costs to the nearest thousand. By rounding, you will guarantee that the report totals and subtotals will exactly match the sum(s) of the subordinate values that are printed on the report. If you answer 'No', the numbers may not appear to add up due to round-off error (when in fact they are more accurate).

Round off Dollars to Nearest Thousand?

No Yes

After calculating, the program is ready to print the report. It asks if you want to make the in-house personnel and operations costs exactly match the personnel costs represented in the Personnel data file. So far, the calculations have only considered the Revenue data (and in-house costs are estimated based on the revenues anticipated). If the Personnel data is believed to more accurately represent the personnel costs, then those costs can be forced into the report.

Make the CPB and OPS costs match the Personnel Data?

No Yes

If you answer 'No', the Revenue-based calculations will be used. If you answer 'Yes', then the Personnel-based costs will be forced proportionally into each row, and the Industry (mission and support) columns will take up the difference so that the totals on each line will match the anticipated revenues. Finally, the report is printed.

AMC Charts

This selection opens a submenu of the many AMC-mandated charts which are available. By and large, these reports format the data for rapid insertion into the specified graphics format.

Revenue by Appropriation: This report produces the total revenues by appropriation type (e.g., OMA, RDTE, PROC, DBOF, OTHER) for the Center. It excludes non-TDA organizations and internal transfer revenues.

Revenue by Source: This report produces the total revenues by source for the Center. It excludes non-TDA organizations and internal transfer revenues. Because there are a large number of sources, this report lists the sources in order of decreasing 8-year total revenues. It also splits the report into two charts. You get to specify the number of sources you want to appear

on the first chart. The remainder of the sources are totalled under 'OTHER' on the first chart, and then they are separately listed on the second chart.

OMA Revenue by Source: This report produces the total OMA revenues by source for the Center. It is identical to the 'Revenue by Source' report above except that it is restricted to OMA revenues.

RDTE Revenue by Source: This report produces the total RDTE revenues by source for the Center. It is identical to the 'Revenue by Source' report above except that it is restricted to RDTE revenues.

PROC Revenue by Source: This report produces the total PROC revenues by source for the Center. It is identical to the 'Revenue by Source' report above except that it is restricted to PROC revenues.

DBOF Revenue by Source: This report produces the total DBOF revenues by source for the Center. It is identical to the 'Revenue by Source' report above except that it is restricted to DBOF revenues.

Other Revenue by Source: This report produces the total other (non-OMA, RDTE, PROC, or DBOF) revenues by source for the Center. It is identical to the 'Revenue by Source' report above except that it is restricted to other revenue types.

Revenue by Group: This report produces the total revenues by group (e.g., DIRECT, AMC, ARMY, DOD, GOVT, OTHER) for the Center. It excludes non-TDA organizations and internal transfer revenues.

Manpower by Type: This report produces the total workyears by type for the Center. It reports full time, overtime, part time, temporary, non-TDA (both internal to the Center and in non-TDA organizations), contractor, and military workyears.

Capital Invest by Source: This report parallels the revenue by source reports in that it is split into two charts. Instead it reports the capital investments. The capital investments associated with specific revenues are easy to categorize by source. The general investments are allocated to the revenues (and their sources) proportionally to the size of the revenues.

In-House/Out-House: This report produces a revenue-based expense summary chart which categorizes the expenses as in-house, major externals, and support

contractors. The externals include all costs of non-TDA organizations (other than OTM) and the chargeable capital investments.

Core Capability Totals: This report lists the core capabilities data in the AMC specified format. First you select a single year to report on. After a period of calculation (where the program is allocating revenues and workyears to the various core capabilities), the report is printed. It consists of a separate page for each combination of Direct/Customer revenue and Appropriation type. If the page is reporting Customer revenues, then the top five customers are listed. Then, for each of the 22 core capabilities, the in-house costs, civilian and military workyears, externals costs to other government agencies, and external costs to other contracts are listed.

The calculations for this report also produces an error report (called 'allerror.txt'), which lists out any Labs/Functions which failed to properly allocate all of their revenues or workyears to the core capabilities. You should check this file for possible errors. This is important because these errors will cause the main report totals to not equal the Center revenues and workyears.

Balance Rev-Pers

This selection opens a submenu of the three balance reports which are available. These reports list the revenues and personnel costs for a specific type of funds. Their objective is to allow the analyst to balance the allocation of personnel with the expected revenue. This can be a problem for the BPM since the revenues and personnel are entered independently. For example, personnel can be characterized as being assigned to OMA funds when insufficient revenues are anticipated to pay for their salaries. The BPM does not attempt to ensure that a balance exists. Only these reports do that.

There are three reports, based on the appropriation type. Each report totals the revenues of the correct type, subtracts the external costs associated with the revenues, and computes the remaining funds available to pay personnel-related expenses. Then, the loaded CPB costs for correct type of personnel are totalled. These are compared with the funds available and the difference is printed.

R Type Balance: This report balances the revenues and personnel-related expenses for all funds other than OMA direct and DBOF (which is mostly RDTE and reimbursable OMA funds). All personnel marked as TDA Category type 'R' are included.

O Type Balance: This report balances revenues and personnel-related expenses for direct OMA type funds. All personnel marked as TDA Category type 'O' are included.

D Type Balance: This report balances revenues and personnel-related expenses for DBOF type funds. All personnel marked as TDA Category type 'D' are included.

Tech Support Amts

This selection opens a submenu which allows you to choose from the four Tech Support categories appropriate to Belvoir, each with its own report. They are:

- ***ILS (Integrated Logistics Support)**
- ***IMO (Information Management Office)**
- **FSD (Facilities Support Directorate)**
- **PAED (Prod Assurance and Engr Directorate)**

All of these four reports produce a listing by Lab and Function of the aggregate amount that each is planning to contribute to the funding of the particular Tech Support area. This adds up to the total "pooled revenue" for the Tech Support area which is displayed on its Baseline Analysis screen.

2.6 Factors

When you are at the Function-level analysis screen, you are also able to view and edit the estimating factors for that Function. The estimating factors are used for estimating the non-salary personnel-related expenses. This is the same capability that is available in the Data Entry Module and they have been explained in full in that part of the User's Guide.

3.0 G&A RATE COMPUTATION

This analysis determines the yearly G&A rates required to exactly fund the G&A expenses. It recognizes that some of the G&A expenses are direct funded, and that the G&A rate directly affects the amount of money that is available to be spent on labor (which is, of course, the source of the G&A surcharge). First, the following warning appears to remind you of the importance of the 'Recalc' function.

Required G&A Rate Calculations

These G&A rate calculations require that the Center Analysis totals are current. If you have changed the baseline data, then you must first enter the Center Analysis and select "Recalc".

Ok

The G&A rate is assessed on the non-OMAD labor in the technical mission functions. Note that there is a relationship between the G&A rate and the amount of money available to pay labor costs. As you increase the G&A costs the labor base goes down, which further increases the rate that must be charged. This methodology solves for the actual required G&A rate, including the changes to the labor base. The specific technique used is described in Appendix C, Methodology Summary.

After computing, the following screen is displayed.

Rate Components (\$K)	Reqd G&A Rate							
	1993	1994	1995	1996	1997	1998	1999	2000
Tot G&A Exp	9619	11717	13659	11288	13921	14227	14582	14953
Ext G&A Rev	9600	9933	10235	10045	10053	9827	9809	9792
Req Pooled Rev	19	1784	3424	1243	3868	4400	4773	5161
Cur Pooled Rev	613	3261	5332	2751	6138	6864	7388	7960
CP Labor Base	17441	14310	14603	15944	14685	14506	14447	14446
G&A Rates:								
Required	0.001	0.117	0.217	0.074	0.241	0.275	0.297	0.318
Current	0.029	0.187	0.301	0.141	0.344	0.391	0.423	0.456

The elements of this screen are:

Total G&A Expense: This is the total cost of the G&A function, to include its personnel costs and externals.

External G&A Revenue: This is the total external revenue that is received by G&A organizations. Principally, this is the 6.5 RDTE Management account.

Required Pooled Revenue: This is the difference between the total expense and the external revenue, shown on the two lines above. It is the amount of pooled revenue that the G&A surcharge must obtain to exactly balance out the G&A costs.

Current Pooled Revenue: This is the total pooled revenue that the current G&A surcharge rate generates based on planned external revenues.

Civilian Pay Labor Base: This is the total civilian pay labor base on which the G&A surcharge is applied to yield the current pooled G&A revenue.

Required G&A Rate: This is the G&A rate that would be required to yield just the amount of the required pooled revenue, as it has been defined above. Remember, the methodology does consider that changes in the rate will also affect the labor base on which the rate is computed.

Current G&A Rate: This is the G&A rate currently in effect. It is presented only for comparison with the required rate.

3.1 Accept the G&A Rate

This selection will post the required G&A rates computed in this analysis into the actual G&A rates used in the model. This does a pretty good job of balancing the G&A costs with the pooled revenue, although it is not exact (due to roundoff errors).

Be careful! This will wipe out the G&A rates currently in use. You will also have to recalculate the Center totals in order to see their effect. For that reason, only the System Administrator is allowed to execute this function.

***WHAT IF ANALYSIS
MODULE***

1.0 INTRODUCTION

The "What If" Analysis allows you to vary certain critical parameters and make new assumptions to see what the impacts might be on the totals and balances obtained in the Baseline Analysis module. A critical feature of the What If analysis is that the underlying baseline data is not changed. Of necessity, not all the features of the baseline analysis are available in the What If.

When entering the What If Analysis Module, two things happen. The first is that your current What If data files are backed up. At the conclusion of the What If session, you will be given the opportunity to save your revised data or to recover your original position. You may find this useful if you would like to take a step back during a What If analysis.

You are also greeted with the following message:

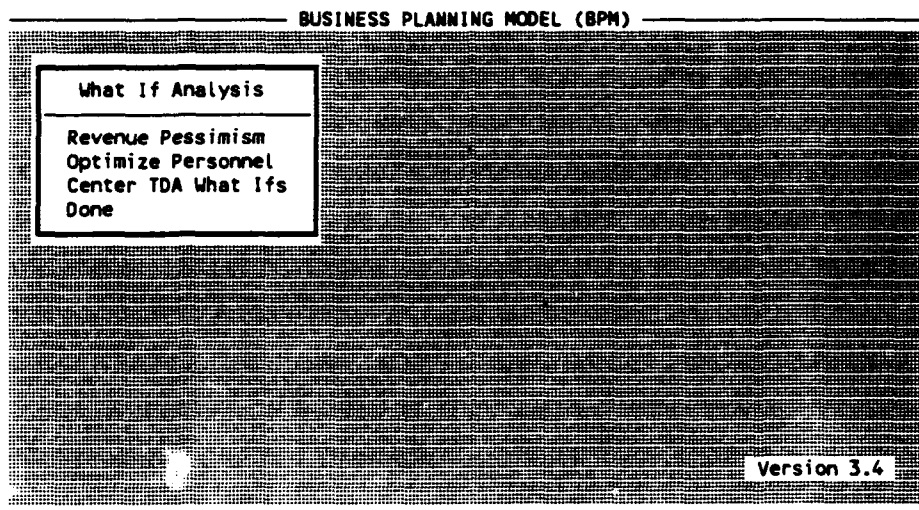
You are entering the What If Module

The What Ifs depend upon what you have entered into the baseline revenue and personnel data. However, changes to the baseline data are not automatically transferred into the What If. To transfer the revised data, you must first "Recalc" totals in the Baseline Center Analysis section, and then re-obtain the "Totals" in the What Ifs.

Ok

As you can see, this is a warning concerning the Center Analysis' 'Recalc' function. The totals produced by the recalculation are vital to the correct operation of the What Ifs. If you need to recalculate, it is best to do so first. If you have already run the Center Analysis', 'Recalc' function, then all you need to do is execute the 'Totals' options in the appropriate What Ifs to bring in the new baseline data. The retotalling of data in the What Ifs is described in each section of this module.

After these two initial actions are complete, the program displays the What If Analysis menu.



The "What If" Analysis module is divided into three categories:

Revenue Pessimism: The Revenue Pessimism What If addresses the impacts of not realizing one or more of the revenues that are scheduled in the baseline data. You allocate the remaining revenues to major cost categories to see how they balance out.

Optimize Personnel: The Optimize Personnel What If makes a preliminary allocation of TDA positions to Labs and Functions based on anticipated revenues and decision rules concerning levels of support required.

Center TDA What Ifs: The Center TDA What Ifs allows you to assign TDA spaces to the various Technical Mission, G&A, and Tech Support Labs and Functions, and lets you see the resulting impact of those assignments on the G&A rates and billing rates for customer work.

All three are loosely integrated together in that the results of one can feed into the next. Although, they can also be run independently. Both the Optimize Personnel and Center TDA What Ifs are Belvoir-specific. They have been hard-coded to respond to the specific organizations within Belvoir. They would have to be carefully examined and rewritten to be applicable to other RDTE Centers.

2.0 REVENUE PESSIMISM

This What If lets you see and analyze the impacts of changes in the anticipated revenues. You get to establish pessimism factors for one or more groups of revenues of your choosing. The screen below illustrates the first step in the Revenue Pessimism What If procedure.

BUSINESS PLANNING MODEL (BPM)

Center What Ifs						Pessimism			
Lab:	Function:	Office:		APPN: OMA		Cat:			
Group:	Source:	Proj No:		Task/PtAcct:					
MDEP:	PE:	1993	1994	1995	1996	1997	1998	1999	2000
% Change:		-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Percent:		96.0	92.2	88.5	84.9	81.5	78.3	75.1	72.1

Leave top fields blank to apply % Change to all revenue records.
Enter something only if you want to apply the percentage factors
to just a select group of revenue records. Add additional records
to make a more complicated judgement.

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This first screen (the red one) shows you one of the pessimism factors, which you tailor to a specific group of revenues. You apply the pessimism factors to a specific type of revenue by defining that revenue in the top section of the screen. In the example above, all of the OMA revenues throughout the Center will be affected by this factor. In each field, you can leave it blank or you can enter a value which corresponds to the revenue records you want to be affected. The blank field works like a wild card. Only fields where you make entries will determine which revenues are affected. Remember, as you edit the fields you can type a '?' in the field to bring up a list of predefined entries in case you do not remember all of the codes. The field definitions are the same as were presented in the Data Entry Module.

% Change: In these fields you enter the percent change in anticipated revenues (either + or -) from year to year. As you enter the percentages, the screen displays the cumulative percent of the baseline revenue (either increase or reduction) that is left after the individual yearly changes.

Add as many pessimism records as necessary to define more complex analyses. Where overlaps exist between two pessimism factors, then they are combined multiplicatively. For example, if one factor reduces OMA revenue to 96% of the baseline amount and another factor reduces CED's revenue to 80% of the baseline amount, then CED's OMA revenue will be reduced to 76.8% ($.96 \times .8 = .768$) of the baseline amount. In this manner, no revenue can be reduced below zero.

2.1 *Limit the Analysis*

By default, the Revenue Pessimism factors will be applied to the Center as a whole. However, you are allowed to limit the analysis to just one Lab or Function, or to look at all G&A organizations in the aggregate.

Limit the What If to just one Lab or Function?			
No	Lab	Function	G&A

You would select 'Limit' to specify a subset of the revenue data that you would like to focus on. If you do decide to limit the data, then the Revenue Pessimism data file which is created in this process will also be limited, and it will not be able to be used to import reduced revenues into the Optimize Personnel or Center TDA What Ifs sections.

2.2 *Apply the Pessimism Factors*

When you have finished defining the pessimism factors, you select 'Ok' from the top line menu to go on to evaluate the impacts of these factors. The following prompt will ask if you definitely want to scan the revenue file:

Scan the revenue file and display results?	
No	Yes

This initiates the process of applying the factors. A copy of the revenue file is made and the factors are applied to it. Then the file is scanned to produce the needed totals. The advantage of this process is that the Revenue Pessimism data file is created, from which

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you can print totals and listing reports to see how the factors affected each and every revenue. In addition, this data file can be used to transfer the results of the pessimism into the other two What If sections.

In the process of scanning the file, there is one other question that you must answer.

Compute Impacts on Externals?	
No	Yes

This question allows you to choose among two methods for handling the external costs associated with each revenue. If you answer 'No', then the revenue has to be completely brought down to zero by the pessimism factors in order for the program to also reduce the externals to zero. If you answer 'Yes', then the externals will be proportionally reduced using the same factors as are applied to the revenues.

2.3 Impacts of Revenue Pessimism

After rescanning the revenue file, the second screen (purple) is displayed. It shows the baseline revenue and the revenue which results from the pessimism factors. And it shows you the workyears and expenses that you get to allocate against the revenues.

BUSINESS PLANNING MODEL (BPM)								
Center What Ifs				Pessimism				
	1993	1994	1995	1996	1997	1998	1999	2000
Baseline Rev	72393	81759	77307	73558	81144	73071	73738	84097
Delta Rev (-)	1944	2698	2381	2700	6048	6162	6844	6961
What If Rev	70449	79061	74926	70858	75096	66909	66894	77136
Baseline Wky	606.9	610.0	608.5	376.5	604.6	605.1	604.5	601.4
Delta Wky (-)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
What If Wky	606.9	610.0	608.5	376.5	604.6	605.1	604.5	601.4
Expenses (\$K)								
Loaded CPB:	19275	20446	20484	13450	21675	22599	23111	23954
Supt Cont:	14102	16659	13030	12578	11725	11071	10496	10490
Major Ext:	40123	46838	44487	44946	41913	34679	35974	46004
Cap Invest:	7	30	6	6	6	6	6	6
Net (Rev-Exp)	-3058	-4912	-3081	-122	-223	-1446	-2693	-3318

This screen is broken up into three sections. The top section presents the original baseline revenues, the reduction in revenues caused by the pessimism factors, and the resulting What If revenues. The middle section displays the same data for workyears. Since no editing has taken place for workyears, the delta which is displayed is all zeros.

The third section displays the elements of cost as they have been adjusted by this What If. They are the loaded CPB costs (all in-house personnel salaries and related costs), the support contractors, the major externals (including non-TDA organizations), and the major capital investments. At the bottom, the net of revenues less expenses is shown.

If you had limited the analysis to a single Lab or Function, then the screen would also show a line for the G&A surcharge which is applied to the organization based on its labor allocation.

Also, as you can see, a new top line menu is created. 'Allocate' brings up a submenu (shown below) which you can use to explore changes in various costs so as to balance the expenses with the revenues. The allocation methods, and the specialized reports, are discussed in the paragraphs below. Please note that when you quit this What If, any allocation you have made will be lost. You should print Pessimism Summary Report first to record the allocation you have made.

Edit Cost Components
What If Workyears
Supt Contract Allocation
Maj Externals Allocation
Cap Investment Allocation
Avg Loaded CPB Per Workyear
What If G&A Rate
Done

2.3.1 *Allocate What If Workyears*

The first screen that comes up here lets you choose between editing the workyears or performing a zero-balance.

Edit Workyears or Zero Balance	
Workyears	Zero Balance

You can edit the What If workyears directly on the screen to change the loaded CPB costs. As you edit the workyears, the loaded CPB expenses and nets will be updated. The G&A surcharge will also be updated if you are conducting a limited analysis.

If you choose to zero balance, then the remaining net difference between revenues and expenses will be made up by automatically adjusting the workyears. In either case, the loaded CPB costs are computed using average workyear costs (which you can also edit - see paragraph 2.3.5 below).

2.3.2 *Support Contract Allocation*

This section draws an underlying screen of detailed data for the support contractors, and then overlays the following prompt.

Edit Dollars or Percents

Dollars Percents Zero Balance

You can edit the Dollars or Percents directly on the screen to change the support contractor costs. Or you choose to zero balance, then the remaining net difference between revenues and expenses will be made up by automatically adjusting the support contractor allocation.

If you select one of the two edit modes, you are placed on the underlying screen to edit the support contractor allocation. You would edit one of the two bottom lines of this screen.

Support Contractors (\$K)								
	1993	1994	1995	1996	1997	1998	1999	2000
Baseline Amt	14218	16912	13207	12811	12129	11506	10899	10951
Delta Amt (-)	116	253	177	233	404	435	403	461
Pessimism Amt	14102	16659	13030	12578	11725	11071	10496	10490
Add Delta (-)	0	0	0	0	0	0	0	0
Revised Amt	14102	16659	13030	12578	11725	11071	10496	10490
% of Revenue	15.6	16.8	14.5	13.8	13.8	14.4	13.6	12.0

This screen displays the baseline costs of support contractors, the revised costs based on the pessimism factors, and the final revised amount which you can edit. The percents

shown are the percentages of What If revenue taken up by this expense. You can edit the final revised amounts or the percentages to additionally cut or restore the amount spent on support contractors.

2.3.3 *Major Externals Allocation*

This section draws an underlying screen of detailed data for the major externals, and then overlays the following prompt.

Edit Dollars or Percents		
Dollars	Percents	Zero Balance

You can edit the Dollars or Percents directly on the screen to change the major externals costs. Or you choose to zero balance, then the remaining net difference between revenues and expenses will be made up by automatically adjusting the major externals allocation.

If you select one of the two edit modes, you are placed on the underlying screen to edit the major externals allocation. You would edit one of the two bottom lines of this screen.

Major Externals (\$K)								
	1993	1994	1995	1996	1997	1998	1999	2000
Baseline Amt	40214	47050	44723	45203	44473	36881	38902	48760
Delta Amt (-)	91	212	236	257	2560	2202	2928	2756
Pessimism Amt	40123	46838	44487	44946	41913	34679	35974	46004
Add Delta (-)	0	0	0	0	0	0	0	0
Revised Amt	40123	46838	44487	44946	41913	34679	35974	46004
% of Revenue	44.4	47.3	49.5	49.5	49.3	45.1	46.8	52.8

This screen displays the baseline costs of major externals, the revised costs based on the pessimism factors, and the final revised amount which you can edit. The percents shown are the percentages of What If revenue taken up by this expense. You can edit the final revised amounts or the percentages to additionally cut or restore the amount spent on major externals.

2.3.4 Major Capital Investment Allocation

This section draws an underlying screen of detailed data for the major capital investments. These are directly chargeable to specific revenue sources, not general capital investments. Then it overlays the following prompt.

Edit Dollars or Percents		
Dollars	Percents	Zero Balance

You can edit the Dollars or Percents directly on the screen to change the capital investment costs. Or you choose to zero balance, then the remaining net difference between revenues and expenses will be made up by automatically adjusting the capital investment allocation.

If you select one of the two edit modes, you are placed on the underlying screen to edit the capital investment allocation. You would edit one of the two bottom lines of this screen.

Capital Investments (\$K)								
	1993	1994	1995	1996	1997	1998	1999	2000
Baseline Amt	7	32	6	6	6	6	6	6
Delta Amt (-)	0	2	0	0	0	0	0	0
Pessimism Amt	7	30	6	6	6	6	6	6
Add Delta (-)	0	0	0	0	0	0	0	0
Revised Amt	7	30	6	6	6	6	6	6
% of Revenue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

This screen displays the baseline costs of capital investments, the revised costs based on the pessimism factors, and the final revised amount which you can edit. The percents shown are the percentages of What If revenue taken up by this expense. You can edit the final revised amounts or the percentages to additionally cut or restore the amount spent on capital investments.

2.3.5 Average Loaded CPB Per Workyear

Edit the average Loaded CPB costs per workyear (in \$). As a default, they are the loaded CPB amount divided by the number of workyears, for each year, as obtained from

the baseline data. You can adjust these numbers as you see fit, and they will affect the current calculations of Loaded CPB cost. Like the allocation, however, they will not be remembered for subsequent analyses. Be sure to print them first if you would like to save them.

Average Loaded CPB Cost (\$) per Workyear								
	1993	1994	1995	1996	1997	1998	1999	2000
Avg CPB/Wky:	31759	33520	33663	35724	35854	37349	38231	39832

2.3.6 *What If G&A Rate*

This edit only applies to the situation where the analysis is limited to a single Lab or Function. Only these analyses have the G&A surcharge applied.

Edit the What If G&A rate. At the beginning of an analysis, these are the same G&A rates used in the baseline analyses. You can adjust these numbers as you see fit, and they will only affect the current calculations of the G&A surcharge. Like the allocation, however, they will not be remembered for subsequent analyses. Be sure to print them first if you would like to save them.

What If G&A Rate								
	1993	1994	1995	1996	1997	1998	1999	2000
G&A Rate:	0.0285	0.1873	0.3007	0.1408	0.3444	0.3907	0.4229	0.4562

2.3.7 *List*

In addition to the standard user-defined listing and totalling reports (described in Appendix A), the following specialized report is offered in this What If:

Pessimism Summary: This report will list out the results of this Revenue Pessimism allocation. This includes the main screen displayed here (purple), as well as each of the individual allocation screens. This is the only opportunity you have to document the analysis, so it is important to produce this report.

3.0 OPTIMIZE PERSONNEL

This What If provides a rapid means of allocating TDA spaces to individual Labs and Directorates within the Center. It is useful if you are trying to meet a target goal for the TDA and you are trying to develop an opening position on how to allocate those spaces. This methodology has been distinctly developed to support the Belvoir RD&E Center's organization. It may not be suitable for general use at other Centers.

The calculations are somewhat complex, and they are circular. Please refer to the Methodology Summary, Appendix C for an in-depth description of the algorithm. When you bring up the screen (shown below) for this What If, it takes a while for the screen to be displayed. After they are displayed, it takes several cycles of computations for the results to stabilize and the top-line menu to appear. At each cycle, the values displayed on the screen are updated (so you can see them converge).

BUSINESS PLANNING MODEL (BPM)										
Year: 1993	Total TDA:	900								
	TB	6.38	6.4	6.5	6.7	OMA	PROC	DBOF	OTH	
Emphasis:	200	100	100	100	100	50	100	100	100	
Staff	TB	6.38	6.4	6.5	6.7	OMA	PROC	DBOF	OTH	TOT
Tech:	309.7	44.2	118.7	21.6	0.3	20.4	62.9	10.9	9.0	597.8
TS:	21.1	6.0	16.2	2.9	0.0	5.6	8.6	1.5	1.2	63.2
G&A:	2.5	0.0	0.0	208.0	0.0	28.4	0.0	0.0	0.0	238.9
Tot:	333.4	50.2	134.9	232.5	0.4	54.4	71.5	12.4	10.2	900.0
(\$K)	TB	6.38	6.4	6.5	6.7	OMA	PROC	DBOF	OTH	TOT
Rev:	26800	7607	20443	14694	59	8529	10835	1880	1546	92393
Tech IH:	11435	1603	4305	753	12	734	2205	371	340	21760
TS IH:	758	216	581	106	2	200	308	53	44	2268
G&A IH:	86	0	0	7056	0	965	0	0	0	8107
OGA:	3229	289	778	3858	18	559	83	0	116	8931
Ext:	11291	5498	14779	2922	27	6071	8239	1455	1045	51327

The top line of the window displays the number of TDA spaces being allocated for a particular evaluation year. The 'Emphasis' values are your relative weightings of Center personnel to each of the particular classes of revenue. In the example screen above, the personnel allocation to the Tech Base is emphasized while the OMA is de-emphasized with respect to the other revenue types.

The next section shows the computed allocation of aggregate personnel spaces among the various categories of technical staff, tech support staff, and G&A staff. Again, these are

divided up by the revenues which support them. As you can see, the spaces are allocated as decimal numbers. The program does not attempt to insure that whole spaces are allocated.

The bottom section shows revenues and costs by revenue type. The costs are broken down into in-house technical, in-house tech support, in-house G&A, other government agencies, and other externals. The total of the costs equals the revenues in each category.

While this report will describe the apparent operation of this What If, you may be interested in the underlying computations. If so, you should refer to Appendix C, Methodology Summary for a more complete description of what is going on behind the screen.

3.1 Edit

When you select 'Edit' from the top-line menu there are only two things that can be edited at this level. You should also look at the 'Factors' menu to view and edit the other variables that control these calculations.

Total TDA: This is the total number of TDA spaces to allocate throughout the Center for this evaluation year.

Emphasis: These are the relative emphasis given to each of the revenue types in the allocation of personnel spaces. You can give emphasis to the Tech Base, for example, by setting the emphasis value for the Tech Base to a higher number. You may need to experiment with these emphasis values to get a desirable distribution of personnel. By default, they are all equal to 100 implying equal emphasis on all types of revenue.

Every time you edit these values, the program automatically recalculates the values displayed on the screen. You should expect that it will pause for a moment while it recalculates.

3.2 View

The 'View' option allows you to look at the more detailed results of the calculations. This selection brings up a pull-down menu which gives you three types of supporting analyses. These are described in the paragraphs below.

3.2.1 *Staff Positions by Lab/Function*

This view displays the number of staff positions the algorithm allocates to each Lab and Function based on the entries you have made. The positions are segregated by those assigned to direct, managers, secretaries, and indirect personnel. The window contains one line for each Function, so you may need to [Page Down] through the list to see it all. This same list can be printed in one of the reports. Press the [Escape] key when you are done viewing this screen.

LAB	FUNCT	TOT	DIR	MGR	SEC	IND
CED	BATDEC	14.1	9.6	2.1	1.4	1.0
CED	BDGING	48.4	32.9	7.3	4.8	3.5
CED	CSRVEL	21.8	14.8	3.3	2.2	1.6
CED	PHYSEC	12.2	8.3	1.8	1.2	0.9
CED	TOPOEQ	4.9	3.4	0.7	0.5	0.4
CED	TUNDET	10.4	7.1	1.6	1.0	0.7
CSD	CMCOBS	235.3	159.8	35.3	23.3	16.8
LED	CEQUIP	4.0	2.7	0.6	0.4	0.3
LED	ELEPWR	49.5	33.7	7.4	4.9	3.5
LED	ENVCTL	31.9	21.7	4.8	3.2	2.3
LED	FNLUBS	41.1	27.9	6.2	4.1	2.9
LED	FUEL	22.8	15.5	3.4	2.3	1.6
LED	MARINE	29.0	19.7	4.3	2.9	2.1
LED	SUPPLY	21.9	14.9	3.3	2.2	1.6
LED	SUPTEQ	3.8	2.6	0.6	0.4	0.3
LED	WATER	16.5	11.2	2.5	1.6	1.2
PAED	MATRLS	11.9	8.1	1.8	1.2	0.8
ACQE	OTM	15.5	10.5	2.3	1.5	1.1

3.2.2 *In-House Costs by Lab/Function*

This view displays the total calculated in-house cost for each Lab/Function. These are the revenues for the Lab/Function, less the costs of the externals. Again, the list is lengthy, so you may need to [Page Down] through the list to see it all. This same list can be printed in one of the reports. Press the [Escape] key when you are done viewing this screen.

LAB	FUNCT	IH (\$K)
CED	BATDEC	485
CED	BDGING	1747
CED	CSRVEL	743
CED	PHYSEC	407
CED	TOPOEQ	167
CED	TUNDET	407
CSD	CMCOBS	9148
LED	CEQUIP	124
LED	ELEPWR	1829
LED	ENVCTL	1066
LED	FNLUBS	1239
LED	FUEL	770
LED	MARINE	1057
LED	SUPPLY	766
LED	SUPTEQ	115
LED	WATER	615
PAED	MATRLS	460
ACQE	OTM	522

3.2.3 Revenues by Lab/Function and Fund Type

This view displays the breakout of revenues by function and type of revenue. This is the fundamental data which drives this What If methodology. The existence of revenues drives the need for technical staff. Again, the list is lengthy, so you may need to [Page Down] through the list to see it all. This same list can be printed in one of the reports. Press the [Escape] key when you are done viewing this screen.

FUNCT	TB	6.3B	6.4	6.5	6.7	OMA	PROC	DBOF	OTH	TOT
BATDEC	581	0	828	133	0	369	119	0	0	2030
BDGING	533	1295	5499	223	59	78	124	32	0	7843
CSRVEL	1326	0	0	623	0	160	186	220	0	2515
PHYSEC	0	0	1865	0	0	12	227	0	0	2104
TOPOEQ	0	0	93	111	0	194	495	54	0	947
TUNDET	402	0	0	0	0	1981	0	0	0	2383
CMCOBS	16252	1765	4362	293	0	0	763	0	826	24261
CEQUIP	0	0	0	279	0	62	372	14	0	727
ELEPWR	969	1046	3207	0	0	142	2161	108	0	7633
ENVCTL	1105	186	942	93	0	46	1993	46	0	4411
FNLUBS	3484	0	0	0	0	203	0	0	0	3687
FUEL	0	973	1495	93	0	71	1301	22	0	3955
MARINE	484	1	771	511	0	1207	1707	54	371	5106
SUPPLY	448	1886	433	232	0	85	267	15	0	3366
SUPTEQ	0	0	0	0	0	35	615	22	0	672
WATER	258	455	666	316	0	79	505	0	349	2628
MATRLS	809	0	263	0	0	329	0	0	0	1401
ACQE	0	0	0	811	0	1118	0	1293	0	3222

3.3 Factors

As you might expect, there are a number of factors which are used by this What If methodology to compute the number of personnel needed to perform various functions. There are two screens of factors which you can modify to tailor the analysis.

3.3.1 G&A and Tech Support Organization Rates

These are the rates at which support spaces are required. In general, support staff are needed to respond to their projected workload. On this screen, the support organizations are listed, along with their factors.

LAB	FCN	TYPE	FACTOR	LIM	LAB	FCN	TYPE	FACTOR	LIM
PAED	TS	by REVS	1948.00	2	IRAC	G&A	by CONT	1100.00	2
FSD	TS	by REVS	3580.00	2	ISD	G&A	fixed	11.00	2
					MILP	G&A	fixed	1.00	0
ACQD	OTM	by CONT	64.00	2	OCC	G&A	by CONT	410.00	2
ASCO	G&A	by REVS	5370.00	2	PAO	G&A	fixed	4.00	2
CDR	G&A	fixed	12.00	2	PAED	G&A	by CONT	90.00	2
CMO	G&A	fixed	1.00	0	RMD	G&A	by REVS	2315.00	2
EEO	G&A	by PERS	300.00	2	SADB	G&A	fixed	2.00	0
FSD	G&A	by PERS	12.77	2	TLIB	G&A	fixed	4.00	2

REVS - \$K of Total Revenue to generate One Manyear
 PERS - Number of Total Personnel to generate One Manyear
 CONT - Number of Contract Actions to generate One Manyear

Naturally, some organizations by virtue of their function respond to different workload drivers. The methodology allows four kinds of workload drivers.

Fixed: The number of personnel in this function is fixed. It is not workload driven. The Competition Management Office (CMO) is an example of a fixed size function. You enter the number of spaces that you will allocate to this function.

REVS: The number of personnel is related to the total revenue received by the Center. The factor you enter is the \$K of total revenue needed to generate one manyear of work in this function. The Resource Management Directorate (RMD) is an example of this type of function.

PERS: The number of personnel is related to the total number of personnel in the Center. The factor is entered as the number of total personnel needed to

generate one manyear of work in this function. The Equal Employment Opportunity (EEO) office is an example of this type of function.

CONT: The number of personnel is related to the number of contract actions conducted by the Center. This factor is entered as the number of contract actions needed to generate one manyear. The Acquisition Directorate (ACQD) is an example of this type of function. Note that the estimated number of contract actions is affected greatly by the Other Factors which are discussed below.

The baseline factors shown on this screen are those which would result in the 1993 Belvoir TDA given its projected revenues and distribution of positions within the Center. These are the default factors.

The screen also lets you input lower-bound 'Limits' on the number of personnel assigned to any one function. This ensures that the methodology does not assign any fewer than this number of people to a particular function.

3.3.2 *Other Factors*

The other factors (on the screen shown below) support the application of the contract workload factors discussed in the preceding section.

Average Contract Action Size (\$K) by Fund Type								
TB	6.38	6.4	6.5	6.7	OMA	PROC	DBOF	OTH
19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Fraction of Externals Going to OGAs (excl Non-TDA OGAs)								
TB	6.38	6.4	6.5	6.7	OMA	PROC	DBOF	OTH
0.220	0.050	0.050	0.070	0.410	0.010	0.010	0.000	0.100
Maximum Total Amount of Non-TDA OGAs (\$K): 12000								

The first line displays the average contract action size by type of funds. These factors are used to determine the number of contract actions, by dividing the size into the amount of funds available for external contracts (non-OGA).

The second two sets of lines tell the methodology how much of the funds available to be spent out-house are spent on OGA externals and spent on non-TDA organizations supported by the Center. Obviously, the balance of the externals are spent on contract actions, and so the methodology can determine that number.

3.4 List

The specialized reports in this What If exactly parallel the detail screens which were described in section 3.2 above.

Staff Positions by Lab/Function: This report prints the number of staff positions that are allocated to each Lab and Function. The positions are segregated by those assigned to direct, managers, secretaries, and indirect personnel. This is the same data that is contained in the first detail screen.

In-House Costs by Lab/Function: This report prints the total calculated in-house cost for each Lab/Function. These are the revenues for the Lab/Function, less the costs of the externals. This is the same data that is contained in the second detail screen.

Revenues by Lab/Function and Fund Type: This report prints the breakout of revenues by function and type of revenue. This is the fundamental data which drives this What If methodology. The existence of revenues drives the need for technical staff. This is the same data that is contained in the third detail screen.

3.5 Percentage Display

The 'Pct' option toggles the display of percentages of revenue with the actual dollars.

BUSINESS PLANNING MODEL (BPM)										
Year: 1993	Total TDA: 900									
	TB	6.38	6.4	6.5	6.7	OMA	PROC	DBOF	OTH	
Emphasis:	200	100	100	100	100	50	100	100	100	
Staff	TB	6.38	6.4	6.5	6.7	OMA	PROC	DBOF	OTH	TOT
Tech:	309.7	44.2	118.7	21.6	0.3	20.4	62.9	10.9	9.0	597.8
TS:	21.1	6.0	16.2	2.9	0.0	5.6	8.6	1.5	1.2	63.2
G&A:	2.5	0.0	0.0	208.0	0.0	28.4	0.0	0.0	0.0	238.9
Tot:	333.4	50.2	134.9	232.5	0.4	54.4	71.5	12.4	10.2	900.0
(\$K)	TB	6.38	6.4	6.5	6.7	OMA	PROC	DBOF	OTH	TOT
Rev:	26800	7607	20443	14694	59	8529	10835	1880	1546	92393
Tech IH: %	42.7	21.1	21.1	5.1	21.0	8.6	20.4	19.7	22.0	23.6
TS IH: %	2.8	2.8	2.8	0.7	2.8	2.3	2.8	2.8	2.8	2.5
G&A IH: %	0.3	0.0	0.0	48.0	0.0	11.3	0.0	0.0	0.0	8.8
OGA: %	12.0	3.8	3.8	26.3	31.2	6.6	0.8	0.0	7.5	9.7
Ext: %	42.1	72.3	72.3	19.9	45.0	71.2	76.0	77.4	67.6	55.6

The percentage screen displays the same data as was shown at the beginning of this What If discussion, except that the cost components (the bottom five lines of the window) are displayed as percentages of the revenue line, rather than as the actual costs.

You would use this mode to analyze the distribution of revenues. Note that the substantial portion of the 6.5 RDTE funding is used to support the G&A in-house costs and their externals. This is as you would expect since the 6.5 funding is predominately a RDTE Management account. In fact, the algorithm takes special care to ensure that G&A external revenues are spent first on G&A labor, and then on G&A externals. If there are not sufficient G&A external revenues to cover G&A costs, then the balance is proportionally spread among the revenue types (RDTE, PROC, and Other) which are taxed G&A.

3.6 Save the Personnel Allocation

The Optimize Personnel What If and the Center TDA What If are closely tied together. For one thing, they use the same data file(s) to store their common information.

The 'Save' option allows you to direct the BPM to save the personnel allocations that have been computed in this analysis to the data file that is used by the TDA What If. This forces the TDA What If to start off with the 'optimal' allocation of personnel. Simply answer 'Yes' to the following question.

Save Personnel Allocation for the TDA What If?

No Yes

Only the personnel allocation for the current evaluation year is saved. If you want to save other years' data, then you must save each one separately.

In the TDA What If, you will note that the personnel allocations are made in whole workyears. However, the Optimize Personnel algorithm works with fractional workyears, and the 'Save' rounds off the allocation before storing it away.

You should also remember that the Optimize Personnel algorithm really is only a starting point for personnel allocation. In the TDA What If, you get to examine and adjust the allocation of personnel, the number of contractors, the balance of costs with revenues, the balance of support to technical staff, and the size of the externals.

3.7 *Total*

The 'Total' is a critical step in getting the baseline BPM data into the What If and initializing the What If to work properly. This process is simple, but it takes a while. The program asks you to confirm that you want to recalculate the totals.

Recalculate Totals from the BPM data?
No Yes

There is only one other choice for you to make here. It is whether to use the baseline revenue data (as the revenues were entered in the computer), or to use the revenue pessimism file (which contains the revenues as modified by the Revenue Pessimism What If).

Use the Baseline Revenue Data or the Revenue Pessimism File
Baseline Pessimism

After you make this choice, the program selects the appropriate file for the revenue data and proceeds to scan the data and load it into the What If files. Principally, it is totalling revenues and cost driver data. It does not transfer the baseline personnel allocation as the starting position for this What If. This takes a while since there is a lot of work to do here. A complete description of the totalling process is included in the Methodology Summary at Appendix C.

Note that if you select 'Pessimism', the last pessimism file you created will be used. Also, you can only select that file if the last revenue pessimism analysis was not limited to a single Lab or Function. The program will warn you if a the pessimism file was created from a limited What If analysis.

Also note that this is the same 'Total' option that is on the Center TDA What Ifs top-line menu. If you run 'Total' in either What If, you will not need to repeat it for the other What If (unless you change the underlying baseline data). Remember that you also need to run the 'Recalc' option in the Baseline Center/G&A/TS Analysis before you run 'Total' here.

4.0 CENTER TDA WHAT IF

The Center TDA What If allows you to assign personnel by Lab and Function, and see what impact that will have on various measures of performance (including the net 'profit', the G&A rate, and the cost per billable workyear).

To use this module you would:

- 1) Run the Revenue Pessimism and/or the Optimize Personnel What Ifs first if their results are desired in this What If.
- 2) Load the revenue (baseline or pessimism) data into the What If data files (see 'Total', paragraph 4.6). This only needs to be done once, either here or in Optimize Personnel.
- 3) Determine the TDA target strengths you are aiming for (see 'Target', paragraph 4.4).
- 4) Select an evaluation year to work with (use the [PgUp] or [PgDn] keys or use 'Goto').
- 5) Specify the Center-wide factors to use for this year (see 'Edit', paragraph 4.2).
- 6) Go to the organization level (see 'Orgs', paragraph 4.8) which displays TDA positions and computed values for each Lab/Function.
- 7) Allocate the TDA spaces to each organization (see 'Edit', paragraph 4.8.1, or 'Table', paragraph 4.8.3). Keep in mind the resulting total measures for the Center which are displayed at the bottom of the window to balance the revenue producing spaces versus the G&A spaces.
- 8) Return to the Evaluation Year screen (see 'Quit')
- 9) Project the data for this year to future years (see 'Project', paragraph 4.5) and print reports as needed (see 'List', paragraph 4.3).

This is a complex algorithm. See the Methodology Summary, Appendix C for a complete description of this algorithm.

4.1 The Evaluation Year Screen

This initial screen displays the summary data for the Center as a whole for a particular evaluation year. You can select the year you wish to evaluate by using the [Page Up] and [Page Down] keys or by selecting 'Goto' from the top line menu.

BUSINESS PLANNING MODEL (BPM)					TDA What If	
Evaluation Year: 1993						
Tot Rev (\$K): 102,533			WORKYEARS		REVENUE (\$K)	
Tot Exp (\$K): 85,207			Target TDA: 881		Direct: 61,359	
Net (Rev-Exp): 15,220			Distributed: 879		Cust: 41,174	
G&A Req Rate: 0.328			To Allocate: 2		EXPENSES (\$K)	
Cost/Bill MYR: 54,575			Billable: 498.9		Govt: 38,541	
Cost/Total MYR: 41,198			Cont/Govt: 0.056		Ext: 43,926	
					Cont: 2,740	
					IH/OH: 0.940	
RATIOS		M/D	S/D	I/D	% BILLABLE	REV FACTORS
Line:	0.221	0.146	0.105	SEC: 0.25	Direct: 1.000	
Staff:	0.221	0.146		MGR: 0.60	Cust: 1.000	
G&A Tgt Rate:	0.310			IND: 0.25		
Cont/Govt Xchg:	1.000			PAE: 0.30		
					Actual G&A	

The data above the line are the results of a number of what if calculations. These are based in part upon the factors displayed below the line, as well as the specific allocation of TDA spaces to the line and staff organizations and the cost structures of each of those organizations.

The metrics displayed above the line include, starting at the upper left:

- Tot Rev:** The total revenue (in \$K), both direct and customer for the Center. This is the product of the revenue factors (below the line) times the baseline Direct and Customer revenues displayed on the upper right.
- Tot Exp:** The total expenses (in \$K) for the Center, including Government, Externals, and Support Contractors which are separately displayed on the right.
- Net (Rev-Exp):** The difference (in \$K) between the Total Revenues and the Total Expenses. This is roughly a measure of the "profitability" of the Center, where a zero net difference represents a calculated balance between revenues and costs.

- G&A Req Rate:** This is the computed G&A rate that would need to be charged to pay for the G&A costs (those not paid for by external G&A revenues). G&A costs include all costs of the G&A organizations. The computation of this number also relies on the labor allocations in the organizations which pay the G&A surcharge. This computed value can be overridden by specifying a Target G&A Rate (below the line) and forcing its use (see 'Use'). The G&A rate in use is displayed on the bottom edge of the window and is used to compute the actual G&A amount charged to each Lab.
- Cost/Bill MYR:** This is the computed average cost (in \$) per billable workyear. In general, it reflects the cost which should be charged to a customer for an average "fully loaded" workyear. This includes all costs for G&A (not just the surcharged G&A costs) in the numerator. To the right are the billable workyears (see description below) which form the denominator of this fraction.
- Cost/Tot MYR:** This is the computed average cost (in \$) for all distributed (i.e., allocated) workyears. This includes all costs for G&A (not just the surcharged G&A costs) in the numerator and all distributed workyears (displayed to the right) in the denominator.
- Target TDA:** This is the total TDA spaces authorized for this year. This is edited using the 'Target' top line menu choice.
- Distributed:** This is the total number of TDA spaces you have allocated to specific organizations so far in the What If.
- To Allocate:** This is the remaining number of TDA spaces you have left to allocate (simply the difference between Target and Distributed).
- Billable:** This is the computed number of billable workyears. All direct workyears in technical Labs are included. In addition, secretary, manager, and indirect workyears are included as billable to the extent that they are classified as billable in the factors below the line. Finally, PAED G&A workyears can also be classified as billable using the PAE factor below the line.
- Cont/Govt:** This is the computed ratio of total support contractor workyears to total government workyears.

4.2 *Edit*

This menu option lets you edit the Center-wide factors which appear below the line. These factors apply to each of the Labs/Functions included in this What If. The factor values can be different in each Evaluation Year. These Center-wide factors are as follows:

4.2.1 *Ratios*

The following are target ratios of secretaries, managers, and indirect personnel to direct personnel for both line and staff organizations. They exist so that the user only needs to input the direct workyears for any one Lab/Function, and then let the program compute the number of secretaries, managers, and indirect personnel required. In each organization, the user can override the automatic computation of manager, secretary, and indirect workyears and instead enter the desired workyears directly.

Line M/D: Enter the ideal ratio of managers to direct employees for a line organization.

Line S/D: Enter the ideal ratio of secretaries to direct employees for a line organization.

Line I/D: Enter the ideal ratio of indirect to direct employees for a line organization.

Staff M/D: Enter the ideal ratio of managers to direct employees for a staff organization.

Staff S/D: Enter the ideal ratio of secretaries to direct employees for a staff organization.

Two other ratios can also be entered:

G&A Tgt Rate: Enter the target rate for the G&A surcharge that is desired. The actual G&A rate will be computed based on the costs for G&A and the billable labor base that results from the "What If" entries for direct employees by organization. If you prefer to see the effect of using the target G&A rather than the actual G&A rate, you should select 'Use' from the top line menu and then switch the G&A flag. The current G&A flag

in use is noted on the lower right border of the window as 'Actual G&A' or 'Target G&A'.

The implications of this decision are significant to the algorithm. The actual G&A rate presumes that G&A costs will be covered. Using the target G&A rate presumes that G&A costs will be controlled to match the funds available.

Cont/Govt Xchg: Enter the exchange rate for contractors to government employees. A value of 1 indicates that a contractor can replace a government employee exactly. A ratio of 1.1 indicates that for every 10 contractors, 1 direct government employee (not a manager) will be doing nothing but supervising the contractors. The implication is that you will need additional contractor(s) to replace the direct government employees who are now supervising contractors instead of performing their direct missions.

A value other than 1 in this field will have some non-intuitive impacts on the required workyears as you adjust the contractor workload. These occur as the program adjusts the required work to account for the direct government employees needed to supervise the changing number of contractors. See the Methodology Summary, Appendix C for additional details.

4.2.2 Percent Billable

Billable workyears are those workyears in the line Labs/Functions which can be directly billed to revenues. All direct workyears in these organizations are automatically counted as billable. Other types of employees (Secretary, Manager, and Indirect) may also be partly billable. The billable workyears are totaled for each Lab/Function and for the center and used in the calculation of average cost/billable workyear.

SEC: Enter the fraction of time that a secretary spends working on billable work in a line organization.

MGR: Enter the fraction of time a manager spends working on billable work in a line organization.

IND: Enter the fraction of time that an indirect employee spends working on billable work in a line organization.

PAE: Enter the fraction of the work performed by PAED G&A personnel which should be considered 'billable'. This is a deceptive entry because it shows up in the cost/billable workyear. The workyears generated are counted in the denominator while the costs are not counted because they are G&A.

4.2.3 Revenue Confidence Factors

Revenue (Confidence) Factors for direct and customer revenues are used to express some pessimism for how likely the revenues are to be received in a given year. They are multiplied by their respective baseline direct and customer revenues in the upper right corner of the Evaluation Year window, and then added to produce the Total Revenue value in the upper left. By default, these factors are 1.000.

Direct: Enter a confidence factor for the likelihood of receiving the stated direct revenue.

Cust: Enter a confidence factor for the likelihood of receiving the stated customer revenue.

Note that you would probably not want to use both the Revenue Confidence Factors and the data totalled from the Revenue Pessimism file in the same analysis since they both have the same objective. These factors provide only a limited capability to express revenue pessimism when compared with the Revenue Pessimism What If.

4.3 List

Going back to the Evaluation Year top-line menu, the following specialized reports are available:

TDA What If Summary: This report produces a summary table by organization for the current evaluation year. It lists the allocated TDA, and several measures of interest for each organization.

Critical Measures By Year: This report produces a summary of key critical measures for the Center (e.g. G&A rate) for each of the seven evaluation years. You use it to identify trends in the data over the planning horizon.

Last Edit Dates By Year: The system remembers the date of the last time you edited

each of the TDA What If records by organization. This report prints out a table of those dates, so you can see which records have been edited and when.

TDA By Org By Year: This report lists out the assigned TDA by organization by year, so that you can detect any unusual or undesirable fluctuations in the allocated TDA.

4.4 Target

This top line menu choice allows you to enter the target TDA for each of the evaluation years. The target TDA represents total personnel spaces, without regard for how they are funded or to what organizations they belong. In this What If you will allocate those spaces to organizations and see the resulting costs and rate structures.

4.5 Project

This function takes the What If data for the current evaluation year and projects it to all subsequent evaluation years, for all organizational components. It first projects the ratios and factors displayed on this screen, and then it projects the TDA allocation. Finally, it recomputes the totals for each of the affected years.

4.6 Total

This function will recalculate certain totals from the baseline BPM data or from the Revenue Pessimism data. You need to 'Total' whenever you initiate a Center TDA What If exercise, or whenever you change the underlying baseline data. This takes quite a while to do, and it also requires that you 'Recalc' in the Baseline Analysis first.

This is the same as the 'Total' in the Optimize Personnel What If (see paragraph 3.7 above). If you have already run that 'Total' for the current set of baseline data, then you do not need to repeat this step.

4.7 Use

This function lets you toggle between displaying the target or the actual G&A surcharge amounts. One of the following two messages will appear.

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Display Target G&A: The model is currently displaying the G&A amount that would be required to pay for the actual G&A costs as they are currently represented within this What If.

If you select this option, then the target G&A amounts (and the resulting nets) will be displayed instead of the actual amounts.

Display Actual G&A: The model is currently displaying the G&A amount that would be the result of using the target G&A rate. This may or may not have any relationship to the actual G&A costs.

If you select this option, then the actual G&A amounts will be displayed instead of the target amounts.

4.8 Orgs

You would select 'Orgs' to edit and view the allocation of personnel by Lab/Function. When you first enter the Center TDA What If you see the Center summary for an Evaluation Year. By selecting 'Org' you overlay another window to see the What If data for a single Lab/Function (and change the options of your top-line menu) as described below:

BUSINESS PLANNING MODEL (BPM)									
Evaluation Year: 1993						TDA What If			
Lab: CED Function: ALL						What If Data 04/07/93			
						AVG SALARIES (\$/yr)			
TDA	Dir	Sec	Ind	Mgr	Tot	Direct:	29,078		
Current:	83	12	8	18	121	Secy/Adm:	13,676		
What If:	85	12	9	19	125	Indirect:	20,198		
Target:		12	9	19		Manager:	43,769		
Billable MY:	101.7				\$/BillMY: 47,464	Contractor:	32,095		
Cont/Govt:	0.088								
BALANCES (\$)			DIR WKYRS		100%	EXPENSES (\$)			
Direct Rev:	12,602,000		Total:	96.0		Govt Exp:	4,960,999		
Customer Rev:	6,651,000		Govt:	85.0		Cont Exp:	353,045		
Expenses:	13,786,044		Cont:	11.0		Ext Base:	8,472,000		
Actual G&A:	1,065,058		Red:	0.0		Red:	0		
Net (Rev-Exp):	4,401,898		Adj:	11.0		Adj:	8,472,000		
Net (\$K):	15,220	\$/BillMY:	54,575	GA Rate:	0.328	To Alloc:	2		
Recalc On						Actual G&A			

This screen shows the What If data appropriate to a specific organization. Shown in the window are the current, What If, and target strengths in the Lab/Function. On the top right are computed average salaries from the baseline data. These are combined with the What If strengths to compute the costs elements (lower right), and net balances (lower

left). Across the bottom of the window are the Center totals which are kept up to date if the 'Recalc On' flag is set.

4.8.1 *Edit*

There only a few items on this screen that you can edit (the items drawn in yellow rather than white letters). They are the following:

What If (Wkys): These are the TDA spaces provided to this organization for personnel who will be directly performing the mission of the organization. If the Target ratios are being used, then the spaces for secretaries, managers, and indirect will be computed for you. If not, then you will get to enter these values directly. See the 'Use' top line menu choice to toggle these automatic computations on/off.

Percent Direct: This is a percentage factor to reduce the direct workyears by. The direct workyears in an organization may need to be reduced to reflect changes in anticipated revenue, or mission emphasis within the Center. The percentage is automatically computed from the revenue reductions taken in the Revenue Pessimism What If. You may adjust this factor as you see fit.

Red (Wkys): This is the number of contractor workyears which the computed allotment will be reduced by, to yield the adjusted amount. Since contractors represent a cost to the organization, use this to adjust the allocation of resources to contractor support.

Red (Expenses): This is the amount (in \$) which the baseline externals amount will be reduced by, to yield the adjusted amount. Again, you use this to adjust the allocation of resources to external costs.

As you edit these items, the computed values on this screen will be updated. One consideration you might have while editing these fields is to try to bring the Net (Rev-Exp) into balance. The Center-wide totals displayed below the line at the bottom of the window will be updated when you complete editing (with Auto Recalc On), or when you request the program to recalculate (with Auto Recalc Off). See paragraph 4.8.7 below to see how to set the Auto Recalc toggle.

Org	Govt	Cont	Ratio	Net (\$K)	Ext (\$K)	\$/BillMY
CED	125	11.0	0.088	4,402	8,472	47,464
CSD	102	0.0	0.000	1,897	21,391	56,308
LED	187	35.1	0.188	9,697	11,505	50,480
PAED	4	0.0	0.000	604	123	58,629

The critical factors are the number of government and contractor workyears and their ratio, the net balance (revenues - expenses) for this organization, the adjusted externals, and the average cost per billable workyear.

4.8.5 *List*

The List menu option at the organization level offers you the following specialized report:

Critical Measures By Year: This report summarizes the major data and computed values from this screen, for each year of the What If, for just this organization. It parallels the similar report at the Center level.

4.8.6 *Project*

This menu option projects the TDA data for just this organization to all subsequent years. The What If TDA amounts, and the reduction amounts are copied outward. In addition, the What If TDA also gets copied to the Current TDA for subsequent years.

4.8.7 *Use*

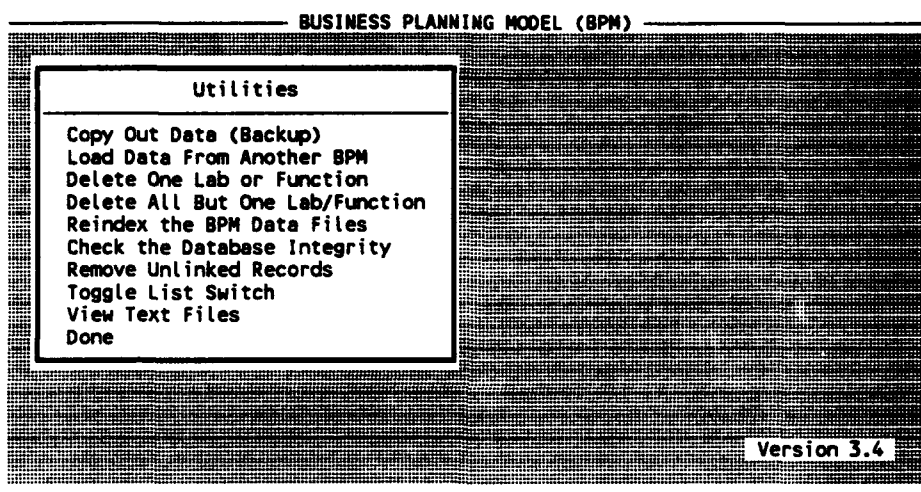
This menu option has two actions:

Specify Workyears or Use Target Wkys: If you select this option, you will switch on or off the ability to enter workyears separately for direct, secretary, indirect, and manager personnel, for just this organization. Otherwise, you will only be able to enter the direct workyears and the others will be computed to match the target values.

Turn Off/On Auto Recalc: Select this switch to toggle the automatic recalculating feature for the Center summary data at the bottom of this window. This data is recalculated each time you edit the data on this screen, or in the table edit window. If you do turn it off and want to recalculate at any time then press the [F9] key.

1.0 INTRODUCTION

The Utilities are those functions which are occasionally required to maintain the BPM. These are available to all users, but they should be used with care. Several of them, particularly the delete utilities, are quite powerful. The Utilities are selected from a submenu:



2.0 UTILITIES

The following paragraphs give a brief description of each of the utilities:

2.1 *Copy Out Data (Backup)*

This utility will copy out data for one Lab or one Function onto a diskette or into another subdirectory of your hard disk. It should be used frequently to BACKUP your data, and also to transfer your data to the central BPM system in your Lab or the Center.

The first question (shown on the next page) asks you whether you want to copy out data for a Lab or for a Function.

Copy out the data for one Lab or Function?

No Lab Function

If you select 'Lab' then a list of Labs will be displayed from which you will select. If you select 'Function' then a list of Labs/Functions will be displayed. Then you will be asked to specify a path in which to put the backup files.

Select Output Data Path

[Drive:] [Path] A:\

This should be either a drive letter for one of your floppy disks (i.e., 'A:' or 'B:') or it should be a **different subdirectory** on your hard disk (e.g., 'C:\BUSINESS\BACKUP'). It is important that the subdirectory be different from your main BPM directory because the backup files will have the **same names** as the principal data files.

2.2 *Load Data from Another BPM*

This utility will load data from another BPM into this database. This is the complement of the Copy Out utility described above. The data to be loaded should be on a diskette or in a separate subdirectory of your hard disk. First you are warned that you should delete any existing data for the Lab or Function which you are going to load.

You should first DELETE any data already in the
BPM database for the LAB or Function you are Loading!

Ok

This is important because the new data will be appended to your existing data. The program makes no attempt to match up the new data with any existing data records. If you do not delete the old data, then there likely will be duplicates (forcing you to delete and reload the new data). See paragraph 2.3 below for information on how to delete data for one Lab or Function.

Then, you will be asked to specify which Lab and/or Function you wish to load.

Load data for one Lab/Function from another BPM?		
No	Lab	Function

If you select 'Lab' then a list of Labs will be displayed from which you will select. If you select 'Function' then a list of Labs/Functions will be displayed. Next, you will be asked to specify a path in which to find the data files that are to be loaded.

Select Load Source Path
[Drive:] [Path] A:\

This should be either a drive letter for one of your floppy disks (i.e., 'A:' or 'B:') or it should be a **different** subdirectory on your hard disk (e.g., 'C:\BUSINESS\DATA'). It is important that the subdirectory be different from your main BPM directory because the load files will have the **same names** as the principal data files.

Finally, the load procedure asks you a question about how to load the factors data.

How do you want to load the Factors?	
The Usual Way	Average Them

The normal response is 'The Usual Way' which simply loads the factors exactly as they have been transferred to you. When you 'Average' the factors, the program weights the factors data by the civilian personnel salary costs that are also reported. This weighting method would be used when you are merging data from various Offices (rather than Functions) into a consolidated Lab database. It produces average factors for each Function by averaging the factors across the Offices which are reported.

2.3 Delete One Lab or Function

This utility will delete all the data for one Lab or Function from your database. You should use this to prepare your database to accept new data for this Lab and/or Function

from another copy of the BPM (see section 2.2 above).

Delete data for one Lab or Function?		
No	Lab	Function

If you select 'Lab' then a list of Labs will be displayed from which you will select. If you select 'Function' then a list of Labs/Functions will be displayed. Then the program asks you to confirm your desire to delete.

Deleting CED. Are You Sure?	
No	Yes

If you answer 'Yes', the program will delete the data for the Lab or Function specified. The deleted records are in the files *revenue*, *external*, *internal*, *products*, *personel*, *wkys*, *capital*, *corecomp*, *factors*, and *totals*. After it deletes the data, it packs the file(s) to remove the deleted records.

2.4 Delete All But One Lab/Function

This utility is used to remove all extraneous data from your BPM database. It is like the other delete utility (see paragraph 2.3 above), except that this one deletes everything but the data for the Lab or Function that you want to keep. This is helpful because it makes the BPM database as small as possible, and therefore the program runs as fast as it can.

Delete data for all but one Lab or Function?		
No	Lab	Function

If you select 'Lab' then a list of Labs will be displayed from which you will select. If you select 'Function' then a list of Labs/Functions will be displayed. **BE CAREFUL!!!** It is easy to confuse this with the other delete utility. This utility deletes A LOT more data so be very careful when you select this one.

Then the program asks you to confirm your desire to delete.

Deleting all but CED. Are You Sure?

No Yes

If you answer 'Yes' the program will delete the data for the Lab or Function specified. The deleted records are in the files *revenue*, *external*, *internal*, *products*, *personel*, *wkys*, *capital*, *corecomp*, *factors*, and *totals*. After it deletes the data, it packs the file(s) to remove the deleted records.

2.5 Reindex the BPM Data Files

This utility recreates the index files for the BPM system. Occasionally, the index files can get confused or corrupted. When this happens, the most common symptom is that data records that you know are there are no longer visible. The most common reason that they became corrupted is that the computer was turned off without exiting the program, or because of a power failure. Simply answer 'Yes' to the following question to have the index files rebuilt.

Reindex the BPM data files?

No Yes

Index files are also automatically rebuilt at the beginning of the program when the data files are scanned. If the index file is missing, or has a date/time older than the data file, then it is automatically rebuilt. You can force the BPM to rebuild the index files by deleting them. To do this type 'delete *.nt*' at the C:\BUSINESS> prompt.

2.6 Check the Database Integrity

This utility performs a number of quality control checks. It checks the principal data files (*factors*, *revenue*, *personel*, *capital*, and *corecomp*) to ensure that all their records are matched in the Organization table. It also checks the files associated with the Revenue and Personnel files (*external*, *internal*, *products*, and *wkys*) to ensure that they have matching records there. The utility only asks that you confirm your desire to perform the validation check.

Perform a Database Validation Check?

No Yes

The check produces a report which lists, file by file, the deficiencies that are found. You can print the report and investigate the causes of the problems. And, you can remove the offending records using the 'Remove Unlinked Records' utility described next.

2.7 Remove Unlinked Records

This utility performs the same checks as above, but it deletes the unlinked records rather than simply producing a report. This will delete any record in *revenue*, *personel*, *factors*, *corecomp*, or *totals* that is not matched in the *orgs* table, and any record in *external*, *internal*, or *products* that is not matched in *revenue*, and any record in *wkys* that is not matched in *personel*.

Remove Unlinked Records from the Database?

No Yes

Simply answer 'Yes' to the prompt to have the unlinked records removed.

2.8 Toggle List Switch

This utility will toggle the switch used in the user-defined listing reports which controls which records get printed. The default condition is that when you ask to print numerical data (such as revenue amounts), records that do not contain any information and hence do not affect the totals are suppressed. This feature prevents the revenue listing from including, for example, all of the zero revenue records entered by the G&A Functions (which they entered so that they could record their externals).

If you want to see all of the records, regardless of whether they contain numerical data, then simply select 'Yes' at the following prompt. This switch will be set for the remainder of the program session (unless you change it here again). When you restart the program, the switch will again be set to the default 'No'.

List records which do not affect the totals?

Yes No (Default)

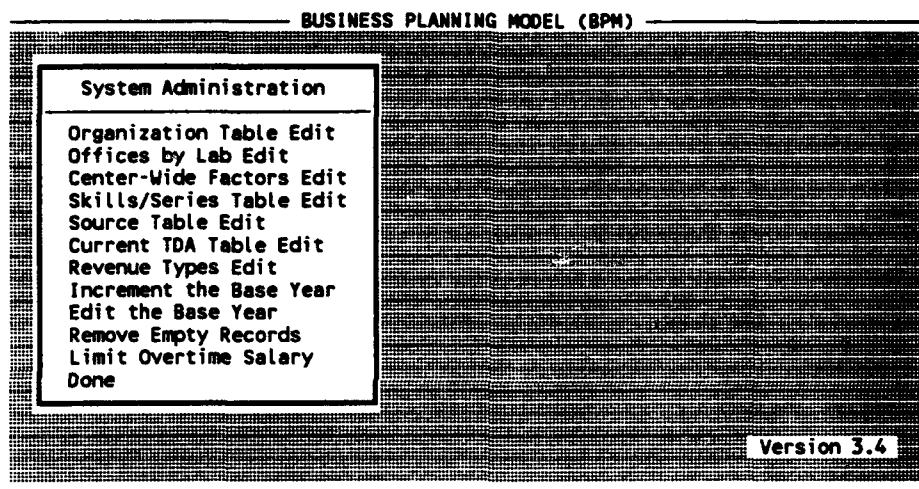
2.9 *View Text Files*

This is the same option that is available on most 'List' menus. It is described thoroughly in Appendix A.

***SYSTEM
ADMINISTRATION
MODULE***

1.0 INTRODUCTION

The System Administration utilities are password protected. Only the System Administrator is allowed to use these because of their impact on the operation of the model, and because of the coordination required among the various users of the BPM. The utilities are selected from a submenu:



The System Administrator also has a number of other capabilities not available to the normal user which are described at the end of this section.

2.0 SYSTEM ADMINISTRATION UTILITIES

The following paragraphs give a description of the system administration utilities:

2.1 *Organization Table Edit*

This utility lets you edit the organization table. This table defines the Labs and Functions that are used in the model. Each Lab must have one or more Functions, each of which gets a title and some other defining data.

Lab: *CPO	Lab Title: CIVILIAN PERSONNEL OFFICE	Labs/Fcns
Function: G&A	Fcn Title: GENERAL AND ADMINISTRATIVE	
Fcn Type: G	On TDA?: N	Enter Revenue?: N

The following rules are used for entering data into this record:

- Use an asterisk (*) as the first character of the Lab name if the Lab is not a part of the Center TDA. Also indicate that the Function is not on the TDA by answering 'N' at the appropriate field. This is important. The costs of Non-TDA organizations are carried as externals to the Center (predominately as G&A expenses). This is a Belvoir-specific feature of the BPM.
- Use the function codes 'G&A' for a G&A Function, 'TS' for a Tech Support Function, and 'OTM' for Functions which are primarily OMAD funded. Use the titles 'General and Administrative', 'Tech Support', and 'Other Technical Mission', respectively for these Functions. This standardization is needed so that these types of functions can be adequately categorized throughout the program.
- Enter the appropriate code letter for the Function Type to describe this Function. The codes are 'G' for G&A, 'I' for Indirect, 'T' for Tech Support, and 'M' for all other organization types.
- Enter a 'Y' at the 'Enter Revenue?' field if this organization is going to be allowed to enter the full range of Revenues. If you enter 'N', then this organization will not be able to enter external revenues (however, they will still be able to create revenue records to recognize internal transfer revenues, and revenue records so that they can enter major externals and support contractor costs). At Belvoir, this is used to control the entry of external G&A revenues to just a single G&A organization.

2.2 *Offices by Lab Edit*

This utility allows the System Administrator to build a control list for the Office field. This field is used in the Revenue, Personnel, and Capital Investments data entry screens for those Labs which would like to collect their data by organization rather than by Function.

Lab: PAED	Office: TS	Offices
Office Title: TEST SUPPORT		

A Lab can have one or more Offices. The Office field in the data entry screens must be either blank or it must have one of the allowable entries from this file.

2.3 Center-Wide Factors

This utility lets the System Administrator edit the Center-wide estimating factors. These factors are the Inflation Rate, the Benefits Rate, and the G&A rate.

Center	Main Factors							
	1992	1993	1994	1995	1996	1997	1998	1999
Inflation	1.0000	1.0370	1.0745	1.1120	1.1498	1.1889	1.2292	1.2711
G&A Rate	0.0285	0.1873	0.3007	0.1408	0.3444	0.3907	0.4229	0.4562
Benefits	0.1331	0.1331	0.1331	0.1331	0.1331	0.1331	0.1331	0.1331

These factors are defined as follows:

- Benefits:** The Benefits factors will be fractions that when multiplied by the civilian salary costs for the Center will equal the dollars planned for the Center's contribution to the employee benefits cost pool (i.e., leave, insurance, retirement, etc.). These factors are the same throughout the Center.
- G&A:** The G&A factors will be fractions that when multiplied by the civilian salary and benefits costs for the selected Function will equal the dollars planned for that Function's contribution to the G&A cost pool. Only certain revenues (and hence salaries/benefits costs) are liable for this G&A surcharge. In general, the surcharge is applied only to non-OMAD and non-DBOF revenues (and to salaries/benefits paid by those revenues) received by all Labs/Functions except G&A and Tech Support. The G&A factors are the same throughout the Center. This is a Belvoir-specific calculation that may be different in other commands (see Appendix B).
- Inflation:** The Inflation factors will be fractions that predict the growth of basic salary costs over the eight years of the planning horizon. Since the costs computed from the other factors are scaled from the civilian salary costs, they in turn will be inflated. The Inflation factors are the same throughout the Center.

2.4 Skills/Series Table

This utility lets the System Administrator edit the control list of Series, Skills, and Job Titles. This table uses a 5 character series code (so that military MOS's can also be entered). The skill code is the OPM 'PATCO' code (with the addition of 'M' for military). These Series are displayed in the pop-up validation menu while entering the Series into the personnel data entry screen.

Series:	00018	Skills
Skill Code:	O	
Title:	SAFETY + OHS	

These fields are defined as follows:

- Series:** This is the four number Series or five letter Military Operational Specialty (MOS) that categorizes a general class of workers. The Series codes are defined by OPM.
- Skill:** This is the one-letter skill code for this series. The skill codes are: P (professional), A (administrative), T (technical), C (clerical), O (other), and M (military).
- Title:** This is a brief description of the Series. The titles are usually defined by OPM.

2.5 Source Table Edit

This utility allows the System Administrator to edit the control list of sources. This table associates a source name with a group name. The groups are hardwired as 'DIRECT', 'AMC', 'ARMY', 'DOD', 'GOVT', 'INTERN', and 'OTHER', but there is no need to enter fields for 'INTERN' since the program automatically associates the 6 letter Function codes as the sources for this group. Data from this table will pop-up when entering data into the revenue and major externals files.

Group:	AMC	Sources
Source:	AMC-FAST	

2.6 *Current TDA Table Edit*

This utility allows the System Administrator to edit the current TDA data by organization. The current TDA is expressed as the number of Direct, Secretary, Indirect, and Management personnel. At present, this data is only used in the Center TDA What If section. Therefore it is important that the function be 'ALL' for the technical labs CED, CSD, and LED. All other functions should be as stated in the organization file.

Lab: ACQD		Function: OTM		Current TDA		
	Dir	Sec	Ind	Mgr	Tot	
Current TDA:	43	3	0	10	56	
					Overall:	982

This data is brought into the 'Current TDA' fields of the Center TDA What If during the 'Total' operation. Once it is brought into the What If, it can only be overwritten by the 'Project' function.

2.7 *Revenue Types Edit*

This utility allows the System Administrator to edit the control list of revenue types. This control list is intended to control the entry of Program Elements, Projects and Tasks/Point Accounts into the Revenue file. This feature is not currently implemented in the BPM and so this data does not need to be entered.

Rev Types		
APPN: OMA	Cat: P20	
PE: 721138	Proj No:	Task/PtAct: 72

2.8 *Increment the Base Year*

This utility adds one year to the base year, and shifts all funding data by one year. With this shift, you lose the data for the previous base year. The data for the added year are copied from the previous last year, so that the last two years will contain the same data. Therefore, the process starts out with the following warning:

This will increment the base year, you will LOSE the data for the current year (1993). BACKUP your data!

Ok

Remember to BACKUP YOUR DATA first! Then you get to confirm that you want to increment the base year to the next year.

Increment the base year to 1994?

No Yes

If you answer 'Yes' to this question, then the data files will all be adjusted so that they display data for 1994 through 2001 (rather than 1993 through 2000). This adjustment physically moves the funding and cost data in each record.

2.9 *Edit the Base Year*

This utility allows the System Administrator to edit the base year, without changing any of the funding sequences. It may be needed if the configuration file, 'bpm.cfg' file is lost.

Edit the Base Year

Base Year: 1993

Simply type in the new year. For example, if you entered '1994' here, then the screens would display the funding from 1994 through 2001 (rather than 1993 through 2000), but the funding and cost data would not be shifted. In this example, data that used to be associated with 1993 would now be associated with 1994.

2.10 Remove Empty Records

This utility allows the System Administrator to delete empty records in the data base files according to the following rules:

personel: any records with blank 'pers_type'.
wkys: any records which have all zero numbers.
revenue: any records which have all zero numbers in revenues, externals, internals, and workyears.
external: any records which have all zero numbers.
internal: any records which have all zero numbers.
products: any records which have blank product and project fields.
capital: any records with blank 'ass_type'.
corecomp: any records with zero 'civ_pct' and 'mil_pct' and 'oga_pct' and 'con_pct'

Then records are added back into the external, internal, and products files as needed so that there will be at least one associated major external, support contractor, major capital investment, internal transfer, and product record for each revenue record. This additional step is needed to support the reporting requirements for the associated data.

Finally, this utility removes the deleted records from the files.

2.11 Limit Overtime Salary

This utility allows the System Administrator to edit the cap on the overtime salary. The cap limits the computation of overtime salary to the specified limit amount. Normally overtime salary is 1.5 times the employee's base salary. However, no overtime salary can be greater than the limit amount.

Edit the Overtime Salary Limit	
Limit (\$):	30000

The number entered here is in whole \$. It should be the limit in effect in the current year. The outyear limit will be adjusted by the inflation factors. By default, the value of \$30,000 is used as the limit until the System Administrator changes this. The new limit is retained in the configuration file ('bpm.cfg').

3.0 Other System Administration Capabilities

3.1 Editing the Help Text

As you have seen, help screens are available at most places in the program. They can be reached by pressing the [F1] key. However, the text displayed in the help screens may be inadequate, or may be missing altogether (an oversight).

The System Administrator can edit the help text (where a normal user cannot). When the help screen is displayed, the System Administrator has a flashing cursor. He can edit the text using the built-in narrative editor. It is a full screen editor, but you will be confined to the size of the current help window (which is somewhat limiting when there is no current help text).

When you are done editing the text, simply press the [Ctrl] and [W] keys simultaneously to save the revised text to the help file.

3.2 Browsing Data Files

The System Administrator can 'browse' the currently active data file at any time by pressing the [F5] key. This key is not active for the normal user. The browse mode arrays the fields and records of the data file into columns and rows, respectively (shown below).

REVENUE									
LAB	FOE	OFFICE	GROUP	SOURCE	REVID	APPN	CATEGORY	MDEP	PROG_ELEM
CED	BDGING	ABCD	INTERN	BATDEC	183	RDTE	6.2	RK01	62786
CED	BDGING		DIRECT	DIRECT	184	RDTE	6.3A		63102
CED	BDGING	ABCD	DIRECT	DIRECT	185	RDTE	6.3B		63804
CED	BDGING		DIRECT	DIRECT	186	RDTE	6.4		64804
CED	BDGING		DIRECT	DIRECT	187	RDTE	6.5		65810
CED	BDGING		DIRECT	DIRECT	188	OMA	P72		
CED	BDGING		DOD	OSD	189	RDTE	6.5		
CED	BDGING		ARMY	PEO-ASM	190	RDTE	6.4		
CED	BDGING		AMC	TACOM	191	PROC			
CED	BDGING		DIRECT	DIRECT	319	RDTE	6.4		64713
CED	BDGING		AMC	TROSCOM	320	PROC			
CED	BDGING		DIRECT	DIRECT	329	DBOF			
CED	BDGING		DIRECT	DIRECT	333	RDTE	6.7		78011
CED	CSRVEL		ARMY	DARPA	192	RDTE	6.2		
CED	CSRVEL		DIRECT	DIRECT	193	OMA	P72		
CED	CSRVEL		DIRECT	DIRECT	194	RDTE	6.5		65810
CED	CSRVEL		DIRECT	DIRECT	195	RDTE	6.4		64804

The active file name is written on the top center of the window border. You can move around in the file to locate the data you want using the arrow keys. This is particularly useful if you are looking for some particular piece of data.

BE CAREFUL! You can also edit the data in the browse mode. Simply start typing new information into any field and it will be entered. If you make a mistake, you can press [Esc] to abort the edit of any particular cell. Once you have accepted the cell, by pressing [Enter] or by pressing the up or down arrows keys, the change is made in the data file and the old contents of the cell are lost. Also, there are no controls on the values that can be entered into the fields in the browse mode.

3.3 Demo Version of the Program

If there is a file 'bpm.dem' in the BPM directory, then the program will begin by displaying a brief message informing the user that the data is provided as a demo of the program's capabilities.

Business Planning Model (BPM) Demo Version

This is the Demo Version of the BPM. It is fully functional. However, the data shown in this demo is purely hypothetical. In no way does it represent actual revenues, expenses, or personnel for the Belvoir RD&E Center. For further information on the BPM, please contact the Belvoir ASCO at (703) 704-2927.

Ok

In the demo version of BPM, the System Administrator password is 'DEMO' if you would like to review the System Administrator's functions.

APPENDICES

APPENDIX A

COMMON REPORTING FEATURES

In each module of the BPM you are able to print various reports for documentation and analysis. The specialized reports have already been described in each module. However, many of the reporting features are the same throughout the program. They are explained here in this Appendix.

1.0 Printer Setup

The BPM program works with any ASCII printer connected to LPT1. The program does not send any special printer codes. It is your responsibility to set up your printer (top of form, font, character set, etc.) the way you desire. If the printer is not working, the program will warn you about that.

2.0 Report Destination (Printer vs. Disk)

You can print every report produced by the BPM directly to a printer, or you may send it to a disk file. Simply select the destination of your choice at the following prompt:

SEND REPORT TO PRINTER OR FILE?

Printer File

If you select 'Printer', the program will immediately try to establish contact with the printer. It may be unsuccessful if the printer is off-line. Simply reset your printer and try again.

You might want to select 'File' if you want to carry this report to another printer or if you want to look at it using the 'View Text Files' option. If you select 'File' you will be prompted for the file name.

Printing to File (.TXT will be added)

Enter File Name:

Enter the file name. This file name can be anything up to 8 characters long. The name you choose does not need to relate to the report being printed, but it should be something you can remember. If the file name already exists in the current directory, the program will ask if you want to overwrite it or enter a different filename.

Remember, printing to a file can be very helpful for several reasons:

- ▲ It is quicker than printing to a printer.
- ▲ The report can be pulled into other software packages, like word processors, spreadsheets, and graphics programs.
- ▲ The report file can be previewed within the BPM by using the 'View Text Files' option.
- ▲ The report can be printed at a later date.

3.0 View Text Files

You can get here from the 'View Text Files' choice which is on each 'List' submenu, or by pressing the [F2] key anywhere within the program.

The first thing displayed is a list of the text files contained in your BPM directory. Each is shown with its size, date, and time. These are the files you have created so that you can preview the reports and incorporate them into other documents. Highlight and select the file you want to work with and press [Enter] to select it.

View/Print/Delete Text File			
CENTER.TXT	6462	06/28/93	16:23
IHOW.TXT	582	06/28/93	16:23
INTERN.TXT	3423	06/28/93	16:23
NETS.TXT	3854	06/28/93	16:23
TEST.TXT	2372	06/28/93	15:31

For each file you can View, Print, or Delete it. The next message asks you to make your choice:

File CENTER.TXT is selected

View Print Delete

- View:** This opens a full screen window in which to view the text file. Use the up and down arrow keys and the [Page Up] and [Page Down] keys to move around in the file. Use the left and right arrow keys to see columns which are not visible. Press the [Esc] key to close the view window when you are done.
- Print:** This sends the text file to the printer just like it had been sent directly from the report in the first place. As you will note while viewing, the text file also contains the control codes for the page ejects.
- Delete:** Deletes the text file and removes it from the list. This will not affect the data in the database. It will only remove the text file. You may need to do this to free up space on your hard drive.

4.0 Screen Format Reports

Screen Format Reports are copies of what you see on the screen in the current window. Except for limiting the output to just the contents of the active window, this is essentially the same as the DOS [Print Screen] key.

5.0 User Defined Listing Reports

A listing report prints out data in tabular format with one line per record. You get to define the way you want it to be printed with **User Defined Listings**. There are three things you need to consider when building the report: (1) which fields to print, (2) what order to print the records, and (3) what data records should be included in the report. The User Defined Listing helps you through these three steps by showing you what you have selected in three columns on the report definition window.

5.1 Fields to Print

The first step is to select the fields you want to print (and the report definition automatically starts here). You do this by selecting 'Print' to get a list of fields, and then highlight and select the fields to print in the order you want them. As you select fields, they are added to the list which appears in the column under 'Print'.

Print:		Select Print Field	K)	51 chars Ok - Print Report
Lab		Lab		
Function		Function		
Group		Office		
Source		Group		
APPN		Source		
Category		APPN		
		Category		
		MDEP		
		PE		
		Proj No		
		Task		
		Revenue (\$K)		
		Net Carryover		
		Net Revenue		
		Direct Wkys		
		Basis		
		Dir/Cust		

If you select a field which has already been selected, then it will be deleted from the print list. As you select fields, the width of the report will be noted in the upper right corner of the window. Be sure not to exceed your printer's width. When you are done selecting fields to print, press the [Escape] key.

5.2 Sort Order for the Report

Next select the fields you want to sort on. You do this by selecting 'Sort' to get a list of fields, and then highlight and select the fields to sort on in the order you want them. The report will be sorted alphabetically (or numerically, depending on the field) by the first sort field selected, and then will be subindexed with each additional field chosen.

There is no requirement to have the sort field(s) included in the list of fields to print. If you do not choose any sort fields, then the report will come out in the order of the file with its current controlling index (which depends, but most likely is Lab/Function order).

Revenue		Select Sort Field	51 chars nt Report
Print:	Sort by:		
Lab	MDEP	Lab	
Function		Function	
Group		Office	
Source		Group	
APPN		Source	
Category		APPN	
		Category	
		MDEP	
		PE	
		Proj No	
		Task	
		Revenue (\$K)	
		Net Carryover	
		Net Revenue	
		Direct Wkys	
		Basis	
		Dir/Cust	

As you select fields, they are added to the list which appears in the column under 'Sort'. If you select a field which has already been selected, then it will be deleted from the sort list. When you are done selecting sort fields, press the [Escape] key.

5.3 Report Filter Conditions

Next select the filter conditions for the report. The filter gives the specifications that any records to be included in your report must meet. You do this by selecting 'Filter on' to get a list of fields, and then highlight and select the fields to use in filters.

Select Filter Field	Revenue Listing (\$K)	51 chars Ok - Print Report
Lab	Filter on:	
Function		
Office		
Group		
Source		
APPN		
Category		
MDEP		
PE		
Proj No		
Task		
Revenue (\$K)		
Net Carryover		
Net Revenue		
Direct Wkys		
Basis		
Dir/Cust		

When you select a field, a window opens up in which you must define what the filter condition is.

Enter Filter Condition

APPN

You do this by specifying first the operator (either = (equals), < > (not equal), > (greater than), < (less than), > = (greater than or equal to), or < = (less than or equal to)) and then entering the field value to use with the operator. For example, you can say **APPN="RDTE"** to limit the report to just those records where the appropriation field is equal to RDTE.

For the field value you can enter a question mark '?' to have the program prompt you for acceptable answers, but you are not limited to them. You can enter just the leading characters of a field and then the match will be made on only the characters you entered. For example, you can eliminate data for all the non-TDA organizations by setting a filter to **Lab < > "*"'**. You select records with an empty field by leaving the field value blank.

As you complete the definition of a filter, it is added to the list which appears in the column under 'Filter on'.

If you select a filter field for a second time, you can create multiple filter conditions using this field.

Filter Exists for this field!

Add new Filter Delete

Select 'Add new Filter' to create another filter using this field, or 'Delete' to remove the existing filter from the filter list. If there is more than one filter established with the selected field, then the last definition is the one which will be deleted. When you are done specifying filters, press the [Escape] key. The filter conditions you have defined will be printed at the end of the report for your information.

Note that multiple filters are combined with 'and' relationships. This means that all filter conditions must be met for the record to be included in the report. For example, the

filter **Lab="CED"** and **APPN="RDTE"** will only include records that are both CED and RDTE. There is no corresponding way to construct an 'or' relationship in the BPM.

5.4 *Printing the Report*

Finally, select 'OK' to print the report. The report format you have defined will be saved, and then retrieved as the starting position the next time you enter this report.

6.0 User Defined Totals Reports

A totals report prints out data in tabular format with one line per common group of records. You get to define the way you want it to be printed with **User Defined Totals**. The screen layout is very similar to the User Defined Listings. There are only two things you need to consider when building the report: (1) which fields to subtotal on, and (2) what data records should be included in the report. The User Defined Totals helps you through these two steps by showing you what you have selected in columns on the report definition window.

6.1 *Subtotal Fields*

First, select the fields you want to subtotal on (and the report definition automatically starts here). You do this by selecting 'Subtot' to get a list of fields, and then highlight and select the fields to subtotal on in the order you want them.

Revenue Totals (\$K)		
Subtot:	Select Subtot Field	nt Report
Lab	Lab	
Function	Function	
APPN	Office	
Category	Group	
	Source	
	APPN	
	Category	
	MDEP	
	PE	
	Proj No	
	Task	
	Dir/Cust	

The selected subtotal fields are automatically printed, along with the numerical data which is collected by the report (e.g. revenue).

Next select the filter conditions for the report, if you want any. This gives the specifications that any records to be included in your report must meet. You do this by selecting 'Filter on' to get a list of fields, and then highlight and select the fields to use in filters.

When you select a field, a window opens up in which you must define what the filter condition is.

You do this by specifying first the operator (either = (equals), < > (not equal), > (greater than), < (less than), > = (greater than or equal to), or < = (less than or equal to)) and then entering the field value to use with the operator. For example, you can say **APPN="RDTE"** to limit the report to just those records where the appropriation field

is equal to RDTE.

For the field value you can enter a question mark '?' to have the program prompt you for acceptable answers, but you are not limited to them. You can enter just the leading characters of a field and then the match will be made on only the characters you entered. For example, you can eliminate data for all the non-TDA organizations by setting a filter to **Lab < > "*" .** You select records with an empty field by leaving the field value blank.

As you complete the definition of a filter, it is added to the list which appears in the column under 'Filter on'.

If you select a filter field for a second time, you can create multiple filter conditions using this field.

Filter Exists for this field!

Add new Filter Delete

Select 'Add new Filter' to create another filter using this field, or 'Delete' to remove the existing filter from the filter list. If there is more than one filter established with the selected field, then the last definition is the one which will be deleted. When you are done specifying filters, press the [Escape] key. The filter conditions you have defined will be printed at the end of the report for your information.

Note that multiple filters are combined with 'and' relationships. This means that all filter conditions must be met for the record to be included in the report. For example, the filter **Lab="CED" and APPN="RDTE"** will only include records that are both CED and RDTE. There is no corresponding way to construct an 'or' relationship in the BPM.

6.3 *Printing the Report*

Select 'Ok' to print the report. The report format you have defined will be saved, and then retrieved as the starting position the next time you enter this totals report.

APPENDIX B

BELVOIR-SPECIFIC FEATURES

The BPM was built for use by the Belvoir RD&E Center. It therefore embodies a number of assumptions and features that are specific to the organization of Belvoir and its particular business environment. Some of these may not be appropriate to the way business is conducted at other Labs and RD&E Centers within AMC.

This Appendix discusses those portions of the BPM which are believed to be Belvoir-specific. If you are interested in applying this model to another Lab or Center, you will want to review this to assess the extent to which this model fills your needs. Of course, the BPM can be tailored to your particular needs.

1.0 BELVOIR ORGANIZATION

The Belvoir RD&E Center is organized into a number of labs, directorates and offices. These are all synonymously referred to in the BPM as "Labs" for brevity and consistency. Each Lab is further subdivided into one or more business areas which are referred to in the BPM as "Functions". Each Function is expected to have a business plan, and in turn each Lab will have a plan which is developed from those of its Functions.

The Functions are further grouped into five types:

Technical Mission: These are the Functions which accomplish the technical work performed by the Center. They are the principal recipients of both direct and customer funding. Their Function designation is unrestrained, but each should be unique.

Laboratory Indirect: These are Functions which exist in the Technical Mission Labs solely for the purpose of administering the Laboratory. The office of the Lab Director and his Programs Office are the principal components of the Lab Indirect Function. They are not separately funded, but instead rely on a surcharge applied to the technical work done by the Lab for their

funding. Each Lab establishes its own surcharge rate to cover its particular costs. Each of these Indirect Functions is identified by their 'INDRCT' Function designation.

General and Administrative: These are the Functions which provide Center-wide support and administration. Examples of these are the Command Group, the Resource Management Directorate, and the Advanced Systems Concepts Office. These Functions are funded out of occasional customer funding, substantial 6.5 direct R&D funding, and a surcharge on the technical work performed by the Technical Mission functions. Each of these G&A Functions is identified by their 'G&A' Function designation.

Other Technical Mission: These are a subgroup of the Technical Mission Functions which are mainly OMAD funded. Their work is mostly technical, but of general applicability to the Center. They would usually be classified as G&A or Tech Support Functions, except that their excess costs (i.e., those costs not fully covered by their OMAD revenues) are covered out of the G&A budget. Any revenues they receive in excess of their costs are returned to the Army and cannot be used to cover other G&A expenses. In addition, they may be liable for G&A surcharges to the extent that they receive non-OMAD revenues. Throughout the model, they are identified by their 'OTM' Function designation.

Technical Support: These are the Functions which provide support to all other Functions on a work-order basis. These are identified by their 'TS' Function designation.

Belvoir operates as a stand-alone RD&E Center. That is, it is not co-located with its Major Subordinate Command (MSC). Therefore, all costs associated with administering the Center are distinctly identified and not shared with other components of the MSC. Resource Management, Procurement, Product Assurance, Facilities, Equal Opportunity, and Information Management are examples of functions provided, funded, and managed by the Center.

Belvoir is also responsible for a number of 'captive' service organizations that do not appear on its TDA. For example, most of its Information Management services are provided by a cell from the Information Systems Command. Belvoir, however is responsible for all costs incurred by this cell since it exists primarily to service the data processing needs of Belvoir. These non-TDA organizations are included in the BPM precisely because most of their cost will be funded by Belvoir. The management of Belvoir reviews their business plans to ensure that their costs are reasonable and

affordable for the services provided. Although the BPM can analyze the costs of non-TDA organizations in the same way as TDA organizations, their costs are rightly included as external costs to the G&A budget within the BPM since that is how they are funded. All non-TDA organizations are identified by the use of an asterisk (*) as the first character of the Lab designation. The BPM recognizes that coding and segregates their costs from the Center's. This same coding method could be used by other RD&E Centers interested in this feature.

2.0 TECH SUPPORT FUNCTIONS

Belvoir has four Tech Support Functions. These Functions provide general services to the other Functions within the Center on a work-order basis. The Tech Support Functions at Belvoir are:

Facilities Support Directorate Tech Support (FSD TS): FSD Tech Support services include motor pool and model shop services.

Information Management Office Tech Support (IMO TS): IMO Tech Support services include computer services (PC maintenance, e-mail, application design & maintenance, non-PC application operation), graphics support, tele-conferences, video services (taping & repro), photography, and exhibits. This is a non-TDA organization.

Integrated Logistics Support Tech Support (ILS TS): ILS Tech Support provides ILS services. These services are only used by the Technical Mission Functions. This is a non-TDA organization.

Product Assurance and Engineering Tech Support (PAE TS): PAE Tech Support services include test operations, RAM and all materials work paid for the work orders. These services are only used by the Technical Mission Functions.

The BPM establishes revenue "pools" from which to fund the Tech Support Functions. These pools are fed by contributions from the other organizations. The contributions are determined by estimating factors based on the total civilian salaries of the contributing organization. This concept of revenue pools allows the BPM to readily scale the size of the Tech Support Functions to the external revenues received by the Center and to the size of its workforce.

However, these "pools" do not have to be used exclusively to fund the Tech Support. The BPM also provides for the internal transfers of revenues. An internal transfer is a specified transfer of funds associated with the receipt of a specific external revenue. You could explicitly identify each transfer to each Tech Support organization and then do away with the pools and their associated factors.

In light of this alternative, it is easy to see why the revenue pools make sense in most cases. They free you from having to plan the specific details of each anticipated revenue. The use of estimating factors and revenue pools allows you to focus on more significant issues in the limited time you have available to do business planning.

In some places, these Tech Support Functions are hard-wired into the BPM. These are:

- (1) The estimating factors are specific to these four Function names. Revising this list is relatively simple.
- (2) The Baseline Center\G&A\TS Analysis can toggle to these specific four Function names. Revising this menu is simple.
- (3) The Optimize Personnel Algorithm includes the two in-house Tech Support Functions explicitly. See the paragraph below which discusses the other Belvoir-specific features of Optimize Personnel. Changes to the organization will require extensive rewriting of this algorithm.

3.0 G&A RATE COMPUTATION

At Belvoir, the G&A surcharge or "tax" is assessed as a percentage of the civilian pay and benefits cost. That is, revenues which are used to pay civilian pay and benefits are additionally charged a G&A tax which is a percentage of those costs. The funds produced by this surcharge are grouped together with the external funding specifically designated to fund G&A costs. Together, these form the G&A revenues.

Not all external revenues are subject to the G&A surcharge. Direct OMA and DBOF revenues are not taxed. All external revenues received by G&A organizations are not taxed.

All other revenues are assessed the same G&A surcharge rate. There is no preferential treatment of direct over customer funding, or segregation of customers monies by type or customer location. The G&A surcharge rate will vary from year to year as the G&A

costs change and as the direct funding of G&A costs changes.

In the Data Entry and Baseline Analysis Modules, the computation of this surcharge is confined to specific areas of the code. It is relatively easy to modify it to conform with other models of G&A. In the What If Analyses, the G&A rate concept is deeply embedded in the code.

4.0 OPTIMIZE PERSONNEL WHAT IF

The Optimize Personnel Algorithm has been specifically developed to support Belvoir's organization. The names of Belvoir Labs and Functions are hard-coded into the program. The default rates and factors used for developing requirements for support organization staffing have been selected to match Belvoir's needs. It will not be immediately usable by any other Lab or RD&E Center without recoding.

On the other hand, the algorithm code has been highly modularized. Computations required for each type of organization have been segregated so that they can be easily maintained. The algorithm could be easily modified to match other structures.

5.0 CENTER TDA WHAT IFS

The Center TDA What Ifs Algorithm has been specifically developed to support Belvoir's organization. In particular, the Technical Mission Labs (CED, LED and CSD) have their Functions consolidated so that they only are displayed as a single organization. More importantly, the computation of the G&A rate and the G&A tax is embedded into the algorithm. It will not be immediately usable by any other Lab or RD&E Center without recoding.

The algorithm used here is more complex and interwoven than the Optimize Personnel What If. The changes needed to match this algorithm to other Labs or RD&E Centers may be difficult depending upon how the excess G&A costs are recaptured.

APPENDIX C

METHODOLOGY SUMMARY

1.0 INTRODUCTION

The Business Planning Model (BPM) was developed by the Belvoir RD&E Center to assist it in planning for the future. Some pertinent questions that it answers are:

- (1) What types of revenues are there likely to be, in what quantities, in which business areas?
- (2) What core government personnel are there likely to be, and to what extent are they covered by revenues? Do the personnel need to be reoriented toward the trends in the revenue? To what extent will temporary employees and support contractors be required to fill in during surge periods?
- (3) What are appropriate levels of internal support to provide for the efficient operation of the Center (i.e., indirect, G&A, and tech support)? How much will this cost? What are the appropriate rates to bill the Center's customers for this support?

The initial cut at this model had each Laboratory and Directorate provide its expected revenues, core personnel and expected expenses. This first data call was very valuable in many ways. The foremost lesson it taught was that the capturing of expenses for internally funded pools (e.g., G&A, Tech Support, and Lab Indirect) is a critical aspect of the business plan which cannot be considered as an afterthought.

This Appendix describes the various methodologies employed in the second phase of the program development. First, it reiterates the overall concept of the model and how it works to estimate expenses by Element of Resource (EOR) and internal transfers of funds to support Indirects, Tech Support, and G&A. Then it proceeds to illuminate the techniques used to perform each of the Baseline and "What If" analyses. These have been the major focus of the model development.

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This Appendix will help to explain the underlying computations that the model performs. Most of the descriptions are quite technical. It will not repeat the material presented earlier in the User's Guide. Paragraphs 2 and 3 describe how the estimating factors are used and how the baseline analyses are conducted. Paragraphs 4 through 6 cover the three "What If" methodologies.

2.0 DATA ENTRY/GENERAL METHODOLOGY

2.1 Overview

The overall idea of this model is to balance the estimated total costs against the available revenue. This should work at any appropriate level of analysis, at the Function/FOE, at the Laboratory/Directorate, and at the Center.

In general, the model estimates most costs based on the amount of the government payroll. It uses multiplier factors for such things as Travel & Transportation costs rather than having the user input these costs specifically. This serves two important purposes. First, it frees the user from having to estimate them manually (since he probably used multipliers to extend from current costs anyway). Second, the use of multipliers greatly enhances the ability to perform "what if" analyses. The impacts of simple changes in anticipated revenue or in personnel projections can be quickly recalculated rather than having to completely reevaluate and reenter the "other" costs.

There are a few issues which complicate the matter:

- (1) A G&A surcharge or "tax" is assessed on salary and benefits costs to make up for a shortfall in direct G&A revenue. However, it is only applied to certain kinds of revenue. The model must be sensitive to the types of revenue and where they are earned.
- (2) Even though each employee is nominally tagged to have his time charged to a certain kind of funds, the employee will be moved as needed to match the revenue that is actually received by the Center. Therefore, calculation of anticipated G&A surcharges must be revenue-based rather than personnel-based.
- (3) Not all revenue is available to be applied to labor. Some of it may have to be committed to pay for major contracts and for support contracts (i.e., there are out-house expenses as well as in-house expenses). Major contracts (to include most MIPRs) must be executed if the revenue is received, so the funds that they represent are not really available for use in-house. Support contracts represent the extension of the Center's core personnel for the performance of a specific mission. Revenue might also be directly committed to major Capital Investments which are needed to

accomplish a specific customer tasking.

- (4) The cost factors that would be used to estimate total costs from the government labor base are different for each Laboratory and Function, and they can be expected to change over the years. Therefore, the model must be able to accommodate trends in the cost factors.
- (5) Expenses for one organization can become "revenues" for others. This is the way that G&A, Tech Support, and Lab Indirect functions are funded (at least in part). Their revenues are "pooled" from surcharges which have been applied to other actual revenues. The model must be able to distinguish these expenses/revenues and not double count them at the appropriate analysis levels.
- (6) There are non-TDA organizations which need to be represented in the model where they impact on Belvoir's costs. Belvoir supports several G&A and Tech Support functions which are not part of Belvoir's TDA. The non-TDA costs, even though they are broken down by EOR for detailed analyses, should be represented as external costs in appropriate summary analyses at the Center level.

2.2 Factors and EOR Calculations

As stated earlier, factors are used to estimate the costs by the various EORs. Separate factors are entered for each Lab and Function. Each factor is separately expressed as a percentage of the Civilian Pay. G&A is assessed on Civilian Pay and Benefits when it applies to the revenue type. The following equation is used as the foundation for balancing costs and revenues:

$$CP * (1+BEN) * G\&A + 1 + BEN + AWD + MS + TT + TNG + CAP + IND + ILS + IMO + PAE + FSD) \\ = (REV + CAI - CAO - MAJ - SUP - CCI)$$

OR:

Loaded Personnel Costs = Revenues available for Loaded Personnel Costs

where:

CP	Civilian Pay = (Work Years) (Average Salary) (Inflation Factor).
BEN	Leave and Benefits factor, applies to all Center employees.
G&A	G&A "tax" factor, applies only to some Personnel and

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	Revenue types, and to the sum of Civilian Pay and Benefits.
AWD	Awards factor. ¹
MS	Materials and Supplies factor. ¹
TT	Travel and Transportation factor. ¹
TNG	Training factor. ¹
CAP	Capital Investment factor (separately computed from data). ²
IND	Laboratory Indirect factor, for certain Labs only. ¹
ILS	Tech Support from ILS factor. ¹
IMO	Tech Support from IMO factor. ¹
PAE	Tech Support from PAE factor. ¹
FSD	Tech Support from FSD factor. ¹
REV	Revenue (external or from internally generated pools).
CAI	Carryover into the current year from the previous year.
CAO	Carryover out of the current year into the next year.
MAJ	Major Contract Costs/MIPRs.
SUP	Support Contract Costs.
CCI	Chargeable Capital Investments.

¹ These factors are set for each Lab and Function. The G&A, Benefits, and Inflation factors are set for the center as a whole.

² The Capital Investment Factor (CAP) for each Lab and Function is computed from the Capital Investment and the Personnel data.

Now, the G&A "tax" is applied only to non-OMAD and non-DBOF revenues. (Note: If the costs of personnel were correctly balanced with the types and amounts of revenues received, then the model would apply the G&A surcharge to the Civilian Pay and Benefits costs which are generated by such revenue as it is done in reality. However, it is unlikely in this database that personnel will be correctly balanced. Therefore, the G&A surcharge is better calculated from the revenue side of the above equation.) Restating, the balancing equation becomes:

$$CP = \frac{(REV+CAI-CAO-MAJ-SUP-CCI)}{(1+BEN)*G\&A+1+BEN+AWD+MS+TT+TNG+CAP+IND+ILS+IMO+PAE+FSD)}$$

so the amount of the G&A surcharge can be computed from CP and the G&A and Benefits factors as:

$$G\&A \text{ Amount} = CP * (1+BEN) * G\&A$$

This is used to compute the total amount of the revenue that is available to be applied to "Loaded" civilian labor costs:

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$$\text{In-House Available} = (\text{REV} + \text{CAI} - \text{CAO} - \text{MAJ} - \text{SUP} - \text{CCI}) - \text{G\&A Amount}$$

Since there is no other place to spend the funds, it is assumed that it all will be spent on "Loaded" civilian labor costs. These are totalled from each personnel record using the formula below and the appropriate rates for each laboratory. It is called the Loaded CPB:

$$\text{Loaded CPB Cost} = \text{CP} * (1 + \text{BEN} + \text{AWD} + \text{MS} + \text{TT} + \text{CAP} + \text{IND} + \text{ILS} + \text{IMO} + \text{PAE} + \text{FSD})$$

Each of the single Elements of Resource (EORs) can be separately calculated using the respective factor. For example, the Travel & Transportation cost can be computed using:

$$\text{TT Cost} = \text{CP} * \text{TT}$$

These general equations are the calculations which are performed on the revenue and personnel data entry screens, and they underly the calculations which are performed in the Baseline Analysis.

2.3 Capital Investment Equations

Capital Investments are entered into the model in two places for two very distinct purposes. The first place is in the revenue section. Here, a specific capital investment is tied to a specific revenue source. The implication is that without that revenue, there would be no need for the investment - the only reason for the investment is to accomplish the tasking required by the revenue. As described above, these types of capital investments are subtracted off the top of the revenue (just like contracts) when computing how much is available for in-house costs.

The second type of capital investments are the non-chargeable kind. Every business regularly buys new equipment, furniture, computers, etc. and upgrades its existing plant and equipment just to stay in business. These investments are well suited to being computed as a percentage of the in-house costs. In the BPM, the costs of non-chargeable investments are estimated using another factor, except that this factor is not entered directly.

Instead, the user is asked to directly enter his capital investment requirements given the personnel and revenue he predicts for the future. This allows the analyst to produce a number of required charts and breakouts concerning those capital investments. There are three components to calculating the cost of a capital investment: current value of an asset, a nominal depreciation period, and any specific new investments.

In the absence of a new investment, the current value is divided by the depreciation period and then multiplied by the inflation factor to determine the cost for any one year i .

$$\text{Curr Repl Cost}_i = (\text{CurrVal} / \text{DepPd}) * (\text{Inflation Factor}_i)$$

This is complicated by the addition of a new investment, because it immediately begins to depreciate and poses additional replacement costs for subsequent years. The program computes the replacement cost in year i for a new investment made in year j as follows:

$$\text{New Repl Cost}_{i,j} = ((\text{New Inv}_j) / (\text{Inflation Factor}_j) / \text{DepPd}) * (\text{Inflation Factor}_i)$$

The total capital investment cost for year i is computed as follows by summing the new investment replacement costs for all years j less than i :

$$\text{Tot Cap Inv}_i = \text{Curr Repl Cost}_i + \text{New Inv}_i + \sum \text{New Repl Cost}_{i,j}$$

In the model, the user is given the option to use the computed replacement costs by selecting 'Post' from the top-line menu, or to enter his own. If he elects to enter his own, then the current and new equipment replacement costs shown above are not used. Instead, the total capital investment costs are simply the sum of the new investments and the entered replacement costs.

The method by which the capital investments are totalled and the capital investment factor is produced is described in the next chapter.

2.4 Limitations in the Data Entry Module

The methodology embodied in these equations seems pretty straightforward. However, there are a few limitations in this technique. All of these limitations are addressed in the Baseline Analysis module of the BPM, which is the subject of the next chapter.

- (1) The model only "taxes" for the various expense pools. Except for the non-chargeable capital investments, it does not make any attempt to ensure that enough funds are set aside to cover the costs in that area. Some of the balancing can be done at the Laboratory/Directorate level. For example, the costs associated with the Laboratory Indirect can be balanced against its pooled revenue. The total expenses estimated for Materials and Supplies, Travel and Transportation, and the Tech Support Pools can be reviewed and compared for reasonableness against expectations of costs in those areas.

- (2) Amounts "taxed" for purposes external to the Laboratory, specifically the G&A and Tech Support pools, cannot be checked against costs until all the data is collected and aggregated. The model provides a capability similar to the Lab Indirect pools to evaluate the sufficiency of the "taxed" funds to cover costs. The decision to balance these costs with their "taxed" pools by changing the tax rate or by changing the cost structure of that function is one to be addressed by Center management.
- (3) The estimates for support contractor expenses expressed in the Revenue section need to be checked against the required support contractor expenses expressed in the personnel section. The model uses the revenue section to estimate the actual support contractor costs. It assumes that the difference between the revenue and the personnel entries represents the 'Materials' portion of T&M support contracts. The model does not force you to balance them (so you could have negative 'materials' costs).
- (4) The model does not force you to balance your personnel-based costs against your revenues. You should balance them if you want to have unambiguous totals to be computed for the personnel-based costs.
- (5) The model does not require that the internal transfers which are anticipated as revenues by one Lab/Function be matched by internal transfer expenses of some other organization. This occurs because the internal transfer expense and its matching revenue are normally reported by two different organizations. The approach taken by the model is to compare the anticipated and the actual internal transfers in the Baseline Analysis after the data files have been merged.

3.0 BASELINE ANALYSIS METHODOLOGY

3.1 *Types of Baseline Analysis*

There are essentially five types of standard baseline analysis contained in the BPM, with a number of variations. These are accessed through the menu entries 'Lab/Function Analysis' and 'Center/G&A/TS Analysis'. All of them present essentially the same set of screens which balance cost elements against revenue. They differ in what the cost elements are and in which revenues are included. These are:

- (1) **Function-level Analysis:** This displays analysis results for a specific Lab and Function. If the function is a Tech Support function, then its 'TS Pooled Rev' is the revenue derived from contributions to this tech support function by other Labs/Functions. If the function is a Lab Indirect function, then its 'Ind Pooled Rev' is the revenue derived to the indirect function by other functions in this lab. Otherwise, it will show the 'Net Carryover' in revenues for this function.
- (2) **Lab-level Analysis:** This is toggled to from the function-level analysis. It displays aggregate results for labs which are collections of functions. If there is a tech support function in the lab, then 'TS Pooled Rev' is included in the revenue. At the lab-level analysis, the contributions made by the other functions to the lab indirect function are not considered as costs. Instead, the actual costs of the indirect function are included with the appropriate cost elements.
- (3) **Center-wide Analysis:** This displays analysis results aggregated for the entire Center. At this level, all costs for non-TDA Labs/Functions in the database are included as major external costs. They are separated out in the externals detail screen. Also, the contributions made to the G&A and tech support functions are not included as costs. Instead, the actual costs of the G&A and tech support functions are included with the appropriate cost elements.
- (4) **G&A Analysis:** This displays analysis results for all those functions which are designated "G&A". The costs of non-TDA G&A functions are included as externals. The amounts contributed by non-G&A functions to the G&A pool are included as 'G&A Pooled Rev'.

- (5) **Tech Support Analysis:** This displays the aggregate totals for all those functions which are designated "TS". The costs of non-TDA Tech Support functions are included as externals. The amounts contributed by non-Tech Support functions to the Tech Support pools are included as 'TS Pooled Rev'. The four individual Tech Support Functions can be analyzed separately through the Lab/Function analysis or through the Center/G&A/TS analysis.

In addition, there is one other baseline analysis called 'G&A Rate Computation'. This analysis determines what the G&A rate would have to be to exactly balance the G&A pooled revenue with the unfunded G&A costs. This is described further in paragraph 3.3 below.

3.2 Baseline Recalculation

All of the baseline analyses, and the what-if analysis as well, depend upon the recalculation of the totals from the baseline data. This is necessary because the baseline data is too bulky to work with directly. Instead, specific totals are precomputed and stored into the file 'totals.dbf' (TOTALS). These totals include all the totals presented on the numerous baseline analysis screens, and a number of other totals needed in the what-if analyses. Recalculation is initiated by selecting 'Recalc' from the baseline analysis horizontal menu. In the 'Lab/Function Analysis', the recalc is only performed for the specific lab being viewed. In the 'Center/G&A/TS Analysis', the recalc is first performed for all labs and then rolled up for the Center wide analyses.

Recalculation causes totals to be entered into the TOTALS file. Each record of this file identifies the totals with a specific Lab and Function, and uses a three letter code to identify which total this record stands for. In this file, funding is represented in unitary dollars (\$) and workyears are multiplied by 100 to eliminate the decimal place. If a specific total for a Function is all zeros, then no record is entered into the file.

The Lab recalculation which is invoked from the LAB/Function Analysis screen does the following steps, which are displayed as pseudocode below. Note that if the recalculation is interrupted (by a computer error, for example), then the results displayed on the analysis screens will most likely be in error (usually all zeros):

- (a) For each Function in the Lab. Get the appropriate factors for this Function from the FACTORS file. Zero out the non-chargeable capital investment factor.
- (b) Total the non-chargeable capital investments from the

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CAPITAL file, making use of the equations presented in paragraph 2.3 for each record. Post the total to the TOTALS file (using code 'CAP' for the total amount and 'NCI' for the new investment portion).

- (c) Total the personnel-based costs and the workyears by type from the PERSONEL file, using the equations presented in paragraph 2.2 for each record. Costs are computed using the formula described above (except that the capital investment factor is zeroed for the present). Costs for contractors are separately computed by ignoring all factors and simply multiplying contractor workyears times the average contractor cost times the inflation factor. Accumulate and post the following totals to the TOTALS file (if they are applicable):

'CP'	Civilian Pay Cost Totals
'BEN'	Benefits Cost Totals
'AWD'	Awards Cost Totals
'IND'	Laboratory Indirect Taxed Amount
'MS'	Materials and Supplies Cost Totals
'TT'	Travel and Transportation Cost Totals
'TNG'	Training Cost Totals
'ILS'	ILS Tech Support Taxed Amount
'IMO'	IMO Tech Support Taxed Amount
'PAE'	PAED Tech Support Taxed Amount
'FSD'	FSD Tech Support Taxed Amount
'TOT'	Total Gov't Personnel-Based Costs (less non-chargeable Capital Investments)
'COT'	Total Contractor Personnel-Based Costs

At the same time, accumulate the total number of workyears by various types and categories. First segregate the Military personnel and the employees which are called 'non-TDA'. The remainder of the non-contract personnel workyears are called 'Government Workyears' and are accumulated by type (full time, part time, overtime, and temporary). All support contractor workyears are accumulated as well. The totals written to the TOTALS file are:

'WKY'	Total Government Workyears (including military and non-TDA within organization)
'FTW'	Total Full Time Gov't Workyears (non-military)
'OTW'	Total Overtime Gov't Workyears
'PTW'	Total Part Time Gov't Workyears
'TEW'	Total Temporary Gov't Workyears
'MIW'	Total Military Workyears (only full time)
'ONW'	Total Non-TDA Workyears (all types)
'COW'	Total Contractor Workyears

- (d) Compute the cost of the average Civilian Workyear (CP/WKY) and the average Contractor Workyear (COT/COW) using the current year data and post the averages to the ORGS file for this Lab/Function.
- (e) Compute the non-chargeable capital investment factor from the previously computed 'CAP' and 'CP' totals (CAP/CP).

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Post this factor to the FACTORS file.

- (f) Total the revenue-based data from the REVENUE file, using the equations described in paragraph 2.2 for each record. Post the following totals to the TOTALS file:

'REV'	Revenue Totals
'MAJ'	Major Externals Totals
'SUP'	Support Contract Totals
'RCI'	Chargeable Capital Investment Totals
'G&A'	G&A Taxed Amount
'AVL'	Amount available for loaded CPB
'CAR'	Net Carryover out of each year

Post the internal transfer revenue types:

'IRV'	The anticipated internal transfer revenues
'INT'	The internal transfer expenses
'AIR'	The actual internal revenues from other Functions
'XIR'	The actual internal transfers within this Function

In addition, to facilitate the computation of the required G&A rates, the following totals are accumulated for just those revenues which are taxed for G&A amounts:

'GCP'	Amount of Civilian Payroll which is charged the G&A tax
'GAV'	Amount Available for loaded CPB which is charged the G&A tax

- (g) Repeat steps (a) through (f) for each Function in the Lab.
- (h) Prepare Lab totals from the sum of each of the Function totals. Indicate the Lab totals by replacing the FOE field with 'ALL'. Subtract the amounts contributed to the lab indirect pool (IND) from the total loaded CPB (TOT) in the lab summary data. Determine the extent of internal transfers (XIR) within the Lab.

The Center recalculation is invoked from the Center Analysis screen. It sequentially calls the above procedure for each Lab, and then it produces the totals for the center. The following eight steps are added:

- (i) Prepare the Center totals from the sum of each of the lab totals. Only include TDA labs. Indicate the Center totals by replacing the field LAB with 'ALL' and the field FOE with 'ALL'. Remove the tech support contribution amounts (ILS, IMO, FSD, and PAE) from the total loaded CPB costs (TOT) since the actual costs will be used instead.
- (j) Prepare corresponding totals for all the non-TDA labs in the Center, except excluding the non-TDA, OTM functions whose

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costs and revenues should not be included in the Center analysis. Indicate these with the LAB of '*ALL' and the FOE of 'ALL'. Remove the tech support contribution amounts as in (i).

- (k) Prepare G&A totals from the sum of each of the TDA functions where the FOE field is 'G&A'. Indicate these totals with the LAB of 'ALL' and FOE of 'G&A'.
- (l) Prepare G&A totals from the sum of each of the non-TDA functions where the FOE field is 'G&A'. Indicate these totals with the LAB of '*ALL' and FOE of 'G&A'.
- (m) Prepare Tech Support totals from the sum of each of the TDA functions where the FOE field is 'TS'. Indicate these totals with the LAB of 'ALL' and FOE of 'TS'. Remove the tech support contribution amounts as in (i).
- (n) Prepare Tech Support totals from the sum of each of the non-TDA functions where the FOE field is 'TS'. Indicate these totals with the LAB of '*ALL' and FOE of 'TS'. Remove the tech support contribution amounts as in (i).
- (o) Prepare totals of Tech Support Contributions from all Labs. This will represent the total revenue for Tech Support Organizations for use in the overall Tech Support analysis screen. Indicate these totals with the LAB of 'ALL', FOE of 'ALL', and pool of 'TS'.
- (p) Prepare the Lab Indirect totals from the sum of each of the TDA functions where the FOE field is 'IND'. These will be used in the what if analysis only. Indicate these totals with the LAB of 'ALL' and FOE of 'IND'. Remove the tech support contribution amounts as in (i).
- (q) Determine the total internal transfers within the Center, within G&A Functions, and within Tech Support Functions.

3.3 G&A Rate Computation

The G&A rate computation determines what the G&A rate ought to be (for each year) to exactly balance the G&A taxed amount with the unfunded portion of the G&A cost. This is possible because the G&A rate will be the same for all the revenue which is subject to the G&A tax. The computation is not straightforward because the G&A rate is taxed on the Civilian Pay amount and changing the rate will affect the amount available for Civilian Pay, hence circularly affecting the amount contributed to G&A.

Fortunately, this can be solved explicitly. The following steps and totals obtained illustrate the methodology:

'COST' The total cost for G&A orgs (This is the sum of in-house and all external and support contractor costs

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for both TDA and non-TDA G&A functions). This is obtained from the TOTALS file.

- 'REV' The total external G&A revenue, obtained from the TOTALS file. The difference between COST and REV is the amount of additional revenue that needs to be taxed to pay G&A costs.
- 'BAMT' The total amount of taxed (or pooled) G&A revenue in the base case, obtained from the TOTALS file. The fact that $\text{COST} - \text{REV} - \text{BAMT} \neq 0$ is what leads to the need to adjust the G&A rate which is assessed.
- 'BCP' The total civilian payroll on which the base case G&A revenue was based, obtained from the TOTALS file.
- 'BAVL' The total amount available to pay loaded CPB costs in the base case, obtained from the TOTALS file.
- 'TOT' The sum of BAMT and BAVL. Note that in the computation of rates, this sum is a constant amount since that is the amount of funds which can be split between G&A and other costs in one way or another.
- 'RAT' The ratio of the civilian payroll to the amount available for loaded CPB costs in the base case, or BCP/BAVL . Note that the ratio between BCP and BAVL will be a constant amount. It is controlled by the various other cost factors which are independent of this analysis.
- 'NAMT' The revised amount of taxed (or pooled) G&A revenue. This is equal to $\text{COST} - \text{REV}$ so that the pooled amount when added to the external revenue exactly equals the total G&A cost.
- 'NAVL' The revised amount available to pay loaded CPB costs given the amount which is removed to pay the the G&A tax, NAMT. This is equal to $\text{TOT} - \text{NAMT}$.
- 'NCP' The revised civilian payroll on which the revised G&A rate will be assessed. This is computed by multiplying the constant ratio by the amount available to pay loaded CPB costs, or $\text{NAVL} * \text{RAT}$.
- 'NG&A' The revised G&A rate. This is the required amount of taxed revenue divided by the civilian payroll base, or NAMT/NCP .

In summary:

$$\text{NG\&A} = \frac{\text{COST} - \text{REV}}{((\text{BAMT} + \text{BAVL}) - (\text{COST} - \text{REV})) * (\text{BCP} / \text{BAVL})}$$

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In tests using sample data, this methodology was able to balance the G&A costs with the external and pooled G&A revenues within a few thousand dollars each year. Note that this calculation makes no assumptions about the Lab/Function's ability to accomplish the work implicit in the revenue if the Civilian Pay amount changes.

4.0 REVENUE PESSIMISM METHODOLOGY

4.1 *Objective*

The Revenue Pessimism "What If" attempts to address the impacts of not realizing one or more of the revenues that are scheduled in the baseline data. There are four principles that drove the design of this module:

- (1) There must be a flexible way of specifying what revenue is to be decremented (incremented). The user must be able to select any one revenue, or an arbitrary collection of revenues about which to express his pessimism.
- (2) The pessimism is best expressed by the user as a percentage change (decrement or increment) in the funding level from the previous year (e.g., OMA direct funding will decrease by 4% each year). Whenever the pessimism forces a specific revenue to zero, then any externals associated with that revenue (i.e. the major externals, support contractors, and major capital investments) are also driven to zero.
- (3) There is a need to print listing and totaling reports from the revised revenues after the pessimism factors have been applied.
- (4) Changes in the aggregate revenue should also require that there be changes in the allocation of revenue to the major elements of cost (which are the in-house labor and other loaded CPB costs, major externals, support contractors, and major capital investments). The user should be able to edit the amounts allocated to these cost elements so as to balance costs with the revised revenue.

4.2 *Application of Pessimism Factors*

The first step is to define the pessimism factors. The user adds a pessimism record if necessary and then specifies which revenue(s) to apply the factors to. He does this by filling in one or more of the fields at the top of the record. A field left blank means that the factors apply to all the records in the database. An entry in one or more of these fields will limit the application of the factor to just those records which match the

entry(s).

After indicating which revenues this pessimism record applies to, the user inputs a percentage change for each year from the previous year. The percentage change is limited to the range of -100 percent to +100 percent for any year. The computer summarizes the entered data as the cumulative percent change from the base year. For any year i , the cumulative percent is the product of the percent change for year i with the cumulative change in the previous year.

$$\%Cum_i = (1 + (\%Chg_i / 100)) * (\%Cum_{i-1})$$

These cumulative percentages become the pessimism factors which are used in the application to the revenue data. Note that the cumulative percent change (pessimism factor) for a year is applied to the baseline revenue in that year, and not to the revenue that was entered for the base year.

The application to the revenue data is straightforward. Each revenue record is scanned in turn. If a revenue record matches any of the pessimism records (in the top section), then the factors for the pessimism record are applied to the revenue data. If two or more pessimism records apply to a single revenue record, then each set of factors are applied to the revenue in turn. The order in which they are applied does not matter. For example, suppose that two sets of pessimism factors (Factor A) and (Factor B) apply to a revenue record. Then the revised revenue in year i is computed as:

$$(\text{Revised Rev}_i) = (\text{Original Rev}_i) * (\text{Factor A}_i) * (\text{Factor B}_i)$$

This calculation is done for each year and all applicable factors. Then, the revised revenue record is written to a separate file (called 'revpess.dbf') for use in additional analyses and reports. The revenue data in this file can also be used in the other two What If options instead of the baseline revenue data.

The costs associated with a revenue can be handled in one of two ways, as specified by the user. If the user selects to compute the impact of revenue changes on the externals, then the externals are reduced proportionally to the extent that the revenue is reduced. If the user selects not to compute the impact of revenue changes, then the externals are not reduced unless the an original revenue is driven to zero by the pessimism factors. In this case, the associated costs for that record (major externals, support contractors, and capital investments) are also zeroed. Note that in this case, if the revenue is not driven to zero, the program makes no changes to the associated costs even if they exceed the revised revenue.

4.3 Allocation of Costs

The analysis screen for this What If displays the total original and revised revenue and the major cost totals against this revenue. The user is allowed to allocate the cost elements so that the total costs are balanced with the total revenue. The program does not require that the costs and revenue be balanced. It is up to the user to explore the alternatives which achieve an acceptable balance.

If the analysis is limited to a single Lab or Function, then the screen also displays the amount of revenue that will be allocated to the G&A surcharge. The amount of the G&A surcharge is a rough estimate which is based on the approximate distribution of revenues in the baseline data (between revenues which are charged G&A and those which are not). It is not an exact calculation because the program has no way of knowing which externals are being adjusted during the allocation process.

The allocated costs for major externals, support contractors, and major capital investments can be directly entered. The user decides how much he is willing to spend on each of these and enters that amount. As these amounts are entered, the overall balance is recomputed.

The loaded cost of government personnel (the Loaded CPB Cost), is computed from the number of government workyears and an average rate per workyear which is derived from the baseline data. Since the data is derived from the TOTALS file, it is important that the totals be recalculated in the baseline analysis first. The personnel cost also affects the G&A cost (if G&A is displayed).

$$\begin{aligned} &(\text{Average Loaded CPB Cost Per Workyear}) = \\ &(\text{Total Loaded CPB}) / (\text{Total Govt Workyears}) \end{aligned}$$

and then

$$\begin{aligned} &(\text{Loaded CPB Cost}) = \\ &(\text{Allocated Govt Workyears}) * (\text{Average Loaded CPB Cost Per Workyear}) \end{aligned}$$

Of course, if you want to edit the Average Loaded CPB Cost per Workyear, you can edit that data directly to revise the computation of the Loaded CPB Cost.

5.0 OPTIMIZE PERSONNEL METHODOLOGY

5.1 *Concept*

The objective of the Optimize Personnel What If module is to allow the analyst to simply enter the total number of personnel assigned to the Center in each year, and to have the program automatically compute a distribution of those personnel among the various technical and administrative Functions within the Center. This computed distribution responds to the amount and type of external revenues received by each Function and to the relative emphasis the Center wants to place on some types of revenues when distributing in-house labor.

For the support Functions, the computed distribution responds to the factors which drive the need for their support. The user is allowed to control these factors as they are applied to each support Function. Four types of factors are used:

- (1) Revenue: The administrative workload is based on total projected revenues of the Center.
- (2) Personnel: The administrative workload is based on the total number of personnel assigned to the Center.
- (3) Contract Actions: The administrative workload is based on the total number of contract actions anticipated for the Center.
- (4) Fixed: The number of administrative personnel in this function is fixed and does not respond to workload drivers.

With the exception of the Functions whose workloads are driven by contract actions, the required number of administrative personnel can be computed directly.

However, the number of contract actions depends on the amount of funds available for externals, which is determined by subtracting personnel-related costs from the revenues. Therefore, the calculation of the "optimum" distribution is circular. The algorithm used in this What If converges on the correct answer by iteratively solving for the distribution of costs among technical and administrative functions, and balancing the revenues against the costs until the balance is zero.

5.2 Optimization Algorithm

The best way to describe the algorithm is to define the calculations that occur in one cycle. The program computes all allocations of personnel and costs by funding type. This is essential because each funding type must be in balance. The information displayed on the screen are the totals of the personnel and funding/costs by fund type for technical and administrative functions.

- (1) Initialize the totals arrays for personnel positions, and for the various costs.
- (2) Sum the distribution of revenues by fund type for the Center as a whole, and also for each technical function.
- (3) Calculate the percentage distribution of total revenues by fund type, and also the percentage distribution of G&A producing revenues (which exclude OMA and DBOF revenues).
- (4) Compute a desired weighting for the number of technical personnel working in each fund type, based on the percentage distribution of total revenues and the emphasis factors entered by the user.
- (5) Compute the number and distribution of administrative personnel by fund type for those functions where the number is based on total revenues, on total personnel, or is fixed (all but the functions based on contract volume). Also compute their costs based on average cost data for each function from the baseline data. These positions and costs will not be affected by the circular calculations.
- (6) Initiate the cyclical calculations by storing the state of the distributed Tech Support and G&A positions and costs at this point. The state of these variables will be restored at the initiation of each cycle.
- (7) Assume that all remaining positions will be filled with technical personnel. Proportionally distribute the remaining positions in each fund type to the technical functions based on their revenues in each fund type and the desired weighting. Compute their associated costs based on average cost data for each function. Note that this uses up the remaining technical positions (not allowing any for contract driven administrative staff); but it provides a start point for determining how much funds will be left over to spend on contracts.
- (8) Compute the utilization of the G&A external revenues. External G&A revenues are applied first to G&A labor costs. If the G&A revenues exceed the labor

costs, then the balance is used to purchase externals. If the revenues are less than the G&A labor costs, then the difference is taxed to the fund types which pay G&A surcharges based on the percentage of their revenues. This step determines where external G&A revenues are applied, and how much surcharge must be applied to other revenues to pay for the excess G&A costs.

- (9) Compute the remaining funds that are spent on externals. Some of these are spent on Other Government Agencies (OGA) and the rest is spent on contract actions which generate additional G&A workloads.
- (10) Compute the personnel required by those G&A functions driven by contract actions, and their associated costs.
- (11) Recompute the utilization of G&A external revenues and then the balance of revenues less costs.
- (12) Reinitiate the cyclical computations beginning at step (6). Terminate the cyclical calculations when the revenues balance with the costs, or when 10 cycles have been performed without convergence. In all tests of the algorithm to date, the program converges in six cycles or less.

5.3 *Baseline Data Reinsertion*

See paragraph 6.3 below for a technical description of how the baseline data is retotaled and inserted into this What If. The same reinsertion technique is used in both What Ifs. In addition to the fields computed for the Center TDA What If, the following other fields are computed from the data and stored in the tda_wif.dbf data file. Note that this data is computed for each Lab/Function and is intended to separate out the sources of revenue for each Function.

RBFT_TB	The amount of Tech Base RDTE revenue (6.1, 6.2, and 6.3A).
RBFT_63B	The amount of 6.3B RDTE revenue.
RBFT_64	The amount of 6.4 RDTE revenue.
RBFT_65	The amount of 6.5 RDTE revenue.
RBFT_67	The amount of 6.7 RDTE revenue.
RBFT_OMA	The amount of OMA revenue.
RBFT_PROC	The amount of Procurement revenue.
RBFT_DBOF	The amount of DBOF revenue.
RBFT_OTH	The amount of other revenue.

6.0 CENTER TDA WHAT IF METHODOLOGY

6.1 *Concept*

The objective of the Center TDA What If module is to allow the analyst to assign TDA spaces to the various Technical Mission, G&A, and Tech Support Labs and Functions throughout the Center, and to see the resulting impact of those assignments on the G&A rates and billing rates for customer work. Naturally, how the TDA spaces are assigned will have substantial impact on these rates.

One of the critical assumptions of the module is that when the allocated TDA spaces fall short of the required workyears in a given Lab or Function, then the deficit will be filled by support contractor workyears. The program does not assume that the work will be scaled back to the allocated workyears. So as you change the allocation of government workyears to any one Lab or Function, the entire cost structure of the center changes.

This is a complicated methodology, which is not easily described. The BPM creates two database files to implement this, 'tda_eval.dbf' (TDA_EVAL) and 'tda_wif.dbf' (TDA_WIF). TDA_EVAL contains the center-wide data, with one record for each evaluation year (there are eight evaluation years, beginning with the base year). TDA_WIF contains the data for the individual Labs and Functions, with one record for each Lab/Function in each evaluation year. The discussion of the methodology will focus on the fields in these data files and how they are used in calculations.

Paragraph 6.2 introduces the parameters that the user sets and which influence much of the calculations.

Paragraph 6.3 discusses the information which is automatically extracted from the baseline data files and used in these calculations.

Paragraph 6.4 provides the algorithms used to compute all the information presented on the Lab/Function screens of this What If. These measures are computed from the extracted data with use of selected parameters.

Paragraph 6.5 provides the algorithms used to compute all the information presented on the main (Evaluation Year) screen of this What If. These measures are mostly totalled and computed from the Lab/Function data.

6.2 Overall Parameters

The first types of fields to discuss are the overall parameters. These are contained in the file TDA_EVAL since they apply to the entire center. They are used to control various computations, and to shorten the input process where possible.

The following are target ratios of secretaries, managers and indirect personnel to direct personnel for both line and staff organizations. They exist so that the user only needs to input the direct workyears for any one Lab/Function, and let the program compute the number of secretaries, managers and indirect personnel. These are used in the computation of WTDA_IND, WTDA_SEC, and WDTA_MGR as described in paragraph 6.4 below.

RAT_SDR_L	The ratio of secretaries to direct workyears in line Labs/Functions.
RAT_IDR_L	The ratio of indirect to direct workyears in line Labs/Functions. There is no RAT_IDR_S since staff organizations do not have indirect Functions.
RAT_MDR_L	The ratio of managers to direct workyears in line Labs/Functions.
RAT_SDR_S	The ratio of secretaries to direct workyears in staff Labs/Functions.
RAT_MDR_S	The ratio of managers to direct workyears in staff Labs/Functions.

Billable workyears are those workyears in the line Labs/Functions which can be billed to direct or customer revenues. All direct workyears in these organizations are automatically counted as billable. In addition, some fraction of the secretary, manager, and indirect workyears are also counted as billable workyears. And, in addition to these line Labs/Functions, some portion of the PAED G&A workyears are characterized as billable. The billable workyears are totalled for each Lab/Function and for the center and used in the calculation of the average cost per billable workyear (which is roughly a measure of what rate should be charged for customer work). See the discussion of WKY_BILL in paragraph 6.4 below for an explanation of how these parameters are used.

DPCT_SEC	The fraction of secretary workyears that are counted as billable.
DPCT_MGR	The fraction of manager workyears that are counted as billable.
DPCT_IND	The fraction of indirect workyears that are counted as billable.
DPCT_PAE	The fraction of PAED G&A workyears that are counted as billable.

Confidence factors for direct and customer revenues are used to express some pessimism

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for how likely the revenues are to be received in a given year. See the discussion of TOT_REV in paragraph 6.5 below for an explanation of how these parameters are used.

CFACT_DIR The confidence factor for direct revenue.
CFACT_CUS The confidence factor for customer revenue.

There is an exchange ratio between government and contractor workyears. This ratio states the number of government workyears which are needed for each contractor workyear. A ratio of 1.00 means that one contractor workyear exactly replaces one government workyear. A ratio of 1.10 means that for every contractor workyear, 0.10 government workyears will be spent supervising the activities of the contractor beyond that which would be spent supervising the activities of the government workyear which was replaced. The use of this ratio is discussed under WKY_TOT in paragraph 6.4 below.

XCHNG The exchange ratio between government and contractor workyears.

The user enters the total number of TDA spaces to allocate for this evaluation year. As spaces are allocated to each Lab/Function, the difference between the number already allocated and the number to allocate is computed and displayed.

TGT_TDA Number of TDA spaces to allocate for this evaluation year.

Finally, there is the target G&A rate. One characteristic of the What If is that it will compute the actual G&A rate, and use that to determine the cost structures within each Lab and Function. Alternatively, the user can select to use a target G&A rate that he enters. If he uses the target rate, then the program will not ensure that the G&A costs balance with the revenues that the rate produces.

GA_TGT The target G&A rate (user entered).
GA_RATE The actual G&A rate (computed by algorithm).

6.3 *Baseline Data Re-Insertion*

Much of the data that drives the What If model are obtained from the baseline data files. As an option, the user can select to use the revenue pessimism data file rather than the baseline revenue file.

The data obtained from the revenue file describe the labor mix of the Lab/Function, the salary structure, the required workyears, and the cost multipliers. The program scans the baseline data files and produces the following totals for each Lab/Function in each

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evaluation year. With the exception of the external expenses, these totals are only computed for Labs/Functions which are on the TDA.

SAL_DIR	The average direct salary. This is the aggregate salaries for full-time, non-military, government TDA personnel characterized by a personnel type of "direct" divided by the total of such workyears. This is adjusted for inflation in each year.
SAL_SEC	The average secretary salary. This is the aggregate salaries for full-time government TDA personnel characterized as "secretary" divided by the total of such workyears. This is adjusted for inflation in each year.
SAL_IND	The average indirect salary. This is the aggregate salaries for full-time government TDA personnel characterized as "indirect" divided by the total of such workyears. This is adjusted for inflation in each year.
SAL_MGR	The average manager salary. This is the aggregate salaries for full-time government TDA personnel characterized as "manager" divided by the total of such workyears. This is adjusted for inflation in each year.
SAL_CONT	The average contractor salary. This is the aggregate salaries for contractor workyears divided by the total of such workyears. This is adjusted for inflation in each year. If this average is zero, then it is set to 2.21 times SAL_DIR.
SFACT_NTS	The sum of the cost factors excluding indirect and tech support. Using the notation in paragraph 2.2, this equals: $1+BEN+AWD+MS+TT+TNG+CAP$.
SFACT_WTS	The sum of the cost factors excluding indirect and including tech support. Using the notation in paragraph 2.2, this equals: $1+BEN+AWD+MS+TT+TNG+CAP+ILS+IMO+FSD+PAE$.
WKY_GOVT	The sum of the workyears reported for non-military, government TDA personnel characterized as direct, including all full time, part time, overtime and temporary workyears.
WKY_CONT	The sum of the workyears reported for contractors.
WKY_TOT	The total of WKY_GOVT and WKY_CONT.
TOT_DIR	The total direct revenue anticipated.
TOT_CUST	The total customer revenue anticipated.
TOT_OMAD	The total OMAD and DBOF revenue anticipated. This is revenue on which the G&A tax will not be charged.
EXP_EXT	The total major externals and major capital investments planned from the revenue file. For non-TDA Labs/Functions, this is the total of all costs for this Lab/Function.
CTDA_DIR	The number of current direct TDA positions. This is changed to the allocated direct TDA positions from the previous year in the projection algorithm.
CTDA_SEC	The number of current secretary TDA positions. This is changed to the allocated secretary TDA positions from the previous year in the projection algorithm.
CTDA_IND	The number of current indirect TDA positions. This is changed to the allocated indirect TDA positions from

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CTDA_MGR	the previous year in the projection algorithm. The number of current manager TDA positions. This is changed to the allocated manager TDA positions from the previous year in the projection algorithm.
CTDA_TOT	The number of current total TDA positions. This is changed to the allocated total TDA positions from the previous year in the projection algorithm.

The various Functions (FOEs) within technical mission Labs are not separately displayed. Therefore, for these Labs, the individual Function totals produced above are retotalled to aggregate the Lab totals in the following fashion:

The fields TOT_DIR, TOT_CUST, TOT_OMAD, EXP_EXT, CTDA_DIR, CTDA_SEC, CTDA_IND, CTDA_MGR, CTDA_TOT, WKY_TOT, WKY_GOVT, and WKY_CONT are simply totalled for the Lab.

The fields SFACT_NTS and SFACT_WTS are weighted averaged over WKY_GOVT.

The fields SAL_DIR, SAL_SEC, SAL_IND, SAL_MGR, and SAL_CONT are weighted averaged over their respective workyears.

These are the baseline data which are then used for the computation of costs and various other measures for each Lab/Function in the What If. Although these data elements are in the data file, the analyst is not normally able to modify them. The system administrator, through the 'browse' function, could edit them if desired.

6.4 Computations for each Lab/Function

The baseline data and the overall parameters described in paragraphs 6.2 and 6.3 lead directly to the calculations which appear on the individual Lab/Function analysis screens.

In addition to the fields which are derived from the baseline data, each Lab/Function has a number of other data elements. Some of these the analyst enters and some of them are computed. The following fields are entered:

WTDA_OK	This is a flag (Y or N) which indicates if the ratios described in paragraph 6.2 above are to be used or not.
WTDA_DIR	The number of direct spaces (workyears) allocated.
WTDA_SEC	The number of secretary spaces (workyears) allocated. If WTDA_OK='Y' then WTDA_SEC = WTDA_DIR*RAT_SEC_L for line Functions and WTDA_SEC = WTDA_DIR*RAT_SEC_S for staff Functions.
WTDA_IND	The number of indirect spaces (workyears) allocated. If WTDA_OK='Y' then WTDA_IND = WTDA_DIR*RAT_IND_L for line Functions. Staff Functions will not have indirect spaces.
WTDA_MGR	The number of manager spaces (workyears) allocated.

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If $WTDA_OK='Y'$ then $WTDA_MGR = WTDA_DIR * RAT_MGR_L$ for line Functions and $WTDA_MGR = WTDA_DIR * RAT_MGR_S$ for staff Functions.

WKY_RED The number of support contractor workyears to eliminate from the requirement. The analyst uses this to control the usage of support contractors (and to minimize their cost impacts).

EXP_REDEXT The amount of the externals cost to eliminate from the requirement. The analyst uses this to control the expenditures on externals to minimize their cost impacts.

UPDATE This is the update date for this record. The user does not explicitly enter it, but it is set to the current date whenever the user edits this record.

The following fields are computed for the user from data and are displayed on the analysis screen:

WTDA_TOT The total of the other WTDA fields, or: $WTDA_TOT = WTDA_DIR + WTDA_SEC + WTDA_IND + WTDA_MGR$.

WKY_BILL The billable workyears. Equals 0 for G&A Functions (other than PAED) and for the Acquisition Directorate (which is OTM). For all other Labs/Functions:
 $WKY_BILL = WTDA_DIR + (WTDA_SEC * DPCT_SEC) + (WTDA_IND * DPCT_IND) + (WTDA_MGR * DPCT_MGR)$. In the special case of PAED G&A, then also do $WKY_BILL = WKY_BILL * DPCT_PAE$.

EXP_GOV The government personnel expense (with tech support). This is: $((WTDA_DIR * SAL_DIR) + (WTDA_SEC * SAL_SEC) + (WTDA_IND * SAL_IND) + (WTDA_MGR * SAL_MGR)) * SFACT_WTS$. On the Lab/Function screen, the expense shown is the expense including tech support costs.

EXP_GOV_N The government personnel expense (without tech support). This is: $((WTDA_DIR * SAL_DIR) + (WTDA_SEC * SAL_SEC) + (WTDA_IND * SAL_IND) + (WTDA_MGR * SAL_MGR)) * SFACT_NTS$. This field is computed but not shown on the Lab/Function screen. It is used in the computation of the Center totals (because Tech Support costs are explicitly included there).

WKY_CONT The adjusted contractor workyears, after consideration for the reduction in contractor workyears. The formula is $WKY_CONT = ADJ_WKY_TOT - WTDA_DIR - WKY_RED$ where ADJ_WKY_TOT is the adjusted total workyears required. The adjustment process is separately described in the next paragraph.

EXP_CONT The cost of support contractors. This equals:
 $EXP_CONT = WKY_CONT * SAL_CONT$.

EXP_ADJEXT The adjusted externals expense after subtracting the amount it is reduced by. It is not allowed to be less than zero. This equals: $EXP_ADJEXT =$

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$\max(\text{EXP_EXT} - \text{EXP_REDEXT}, 0)$.

TOT_REV The total revenue for the Lab/Function. This is:
 $\text{TOT_REV} = \text{TOT_DIR} + \text{TOT_CUST}$. The confidence factors are not applied at the Lab/Function level.

TOT_EXP The total expenses for the Lab/Function. This is:
 $\text{TOT_EXP} = \text{EXP_GOVT} + \text{EXP_CONT} + \text{EXP_ADJEXT}$. Note that this includes tech support costs for the Lab/Function.

TOT_GA The total G&A expense for the Lab/Function. This will be zero for those organizations who are not charged G&A. It will also depend on whether the target G&A or the actual G&A is being displayed.
If the actual G&A rate is used, then:
 $\text{TOT_GA} = \text{GA_RATE} * (\text{EXP_GOVT} / \text{SFAC} * \text{WTS}) * (1 - \text{TOT_OMAD} / \text{TOT_REV})$
If the target G&A rate is used, then:
 $\text{TOT_GA} = \text{GA_TGT} * (\text{EXP_GOVT} / \text{SFAC} * \text{WTS}) * (1 - \text{TOT_OMAD} / \text{TOT_REV})$
As you can see, in both cases the G&A is applied to government salaries only, and only to that fraction of the salaries which are produced by revenues subject to the G&A tax.

TOT_NET The total net profit (revenue-expenses) for the Lab/Function. This is $\text{TOT_NET} = \text{TOT_REV} - \text{TOT_EXP} - \text{TOT_GA}$.

As stated in the computation of WKY_CONT above, the total workyears required is adjusted before displaying and using it in the computation. The adjustment is necessary because of the government to contractor exchange ratio (XCHNG). In the original baseline data, the Lab/Function provides the total workyears required (WKY_TOT) and the number which are provided by the government (WKY_GOVT). From this data, one can determine the number of baseline government employees (workyears) who are only supervising contractors, and hence the minimum number of required workyears if there were no contractors at all. This is:

$$\text{MIN_TOT} = \text{WKY_TOT} - (\text{WKY_TOT} - \text{WKY_GOVT}) * \text{TX}$$

$$\text{where TX} = (\text{XCHNG} - 1)$$

Then you can compute the adjusted total workyears required given that there will be some workyears assigned to contractors:

$$\text{ADJ_WKY_TOT} = \max(\text{WKY_TOT} - (\text{WTDA_DIR} + \text{WKY_RED} - \text{WKY_GOVT}) * \text{TX} / (1 - \text{TX}), \text{MIN_TOT})$$

In addition to the data fields described above, the following measures are computed and displayed on the analysis screen, but are not stored explicitly in the data file.

\$/BILLMY This is the cost per billable manyear. This is computed as the ratio $(\text{EXP_GOVT_N} / \text{WKY_BILL})$.

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CONT/GOVT	This is the ratio between adjusted contractor workyears and total government workyears (WKY_CONT/WTDA_TOT).
CONT WKY	This is the number of direct workyears for contractors before adjustment (ADJ_WKY_TOT-WTDA_DIR).

6.5 Computations for each Evaluation Year

As stated earlier, the TDA_EVAL file contains summary data for each evaluation year. Paragraph 6.2 described the fields in this file which are entered by the user as parameters for the calculations. The remaining fields contain data which are used to compute the critical measures that are displayed on the Evaluation Year screen.

Many of these fields simply contain data which is summarized from the Lab/Function data contained in the TDA_WIF file. An automatic recomputation takes place which sums certain information from all the individual records for an evaluation year and then posts it to the TDA_EVAL file. The following fields are summed:

TOT_DIR	The sum of the direct revenue from the Labs/Functions.
TOT_CUST	The sum of the customer revenue from the Labs/Functions.
TOT_OMAD	The sum of the net revenue less expenses (TOT_NET) for the OTM Functions (excluding the non-TDA OTM Functions). This will be a G&A cost element if it is negative since the excess cost will be made up by the G&A budget.
TOT_GA	The sum of the G&A contributions from the Labs/Functions.
EXP_GOVT	The sum of the government expenses from the Labs/Functions (including tech support contributions).
EXP_CONT	The sum of the contractor expenses from the Labs/Functions.
EXP_EXT	The sum of the external expenses from the Labs/Functions. This includes all costs of non-TDA Labs/Functions since they are external costs to the Center.
EXP_REDEXT	The sum of the reductions in external expenses from the Labs/Functions.
EXP_ADJEXT	The sum of the adjusted external expenses for all Labs/Functions (excluding the non-TDA organizations).
EXP_GOVT_N	The sum of the government expenses from the Labs/Functions, not including their tech support contributions, plus all costs of non-TDA Labs/Functions.
WKY_BILL	The sum of the billable workyears from the Labs/Functions.
WKY_CONT	The sum of the adjusted contractor workyears from the Labs/Functions.
WKY_GOVT	The sum of the government workyears from the Labs/Functions.
WKY_TOT	The sum of the required total workyears from the

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	Labs/Functions. This is not the adjusted total which might vary with the XCHNG parameter.
WTDA_TOT	The sum of the total allocated workyears from the Labs/Functions.
GA_COSTS	The sum of all costs in G&A Functions (TDA & Non-TDA).
GA_REV	The sum of all direct revenue in G&A Functions (TDA & non-TDA).
GA_TEC_SAL	The sum of all technical salaries only (excluding OMAD and DBOF) in regular technical mission Labs/Functions.
TS_COSTS	The sum of all costs for Tech Support Functions (TDA & non-TDA).
LINE_COSTS	The sum of loaded CPB costs (without Tech Support) for the technical mission Labs/Functions.

The remaining fields are perhaps the more interesting ones. These are the principal measures displayed on the Evaluation Year screen. For the most part, they are computed from the summary data fields and from the overall parameters:

AVG_BILLYMY This is the average cost per billable manyear. If you are displaying the actual G&A, then the costs include the actual G&A costs, excess OMAD costs, tech support costs, and line costs, less the G&A direct revenue, then divided by the billable workyears, as in:

$$\text{AVG_BILLYMY} = (\text{GA_COSTS} + \text{TS_COSTS} - \text{IIF}(\text{TOT_OMAD} < 0, \text{TOT_OMAD}, 0) + \text{LINE_COSTS} - \text{GA_REV}) / \text{WKY_BILL}$$

If you are displaying the target G&A, then the actual G&A cost is replaced with the amount taxed as G&A plus the G&A revenue, as in:
$$\text{AVG_BILLYMY} = (\text{TOT_GA} + \text{TS_COSTS} - \text{IIF}(\text{TOT_OMAD} < 0, \text{TOT_OMAD}, 0) + \text{LINE_COSTS}) / \text{WKY_BILL}$$

AVG_TOTMY This is the average cost per total manyear. This is similar to the AVG_BILLYMY except that it includes the G&A direct revenue as a cost element. If the actual G&A is used, then:
$$\text{AVG_TOTMY} = (\text{GA_COSTS} + \text{TS_COSTS} - \text{IIF}(\text{TOT_OMAD} < 0, \text{TOT_OMAD}, 0) + \text{LINE_COSTS}) / \text{WTDA_TOT}$$

If the target G&A is used, then:
$$\text{AVG_TOTMY} = (\text{TOT_GA} + \text{GA_REV} + \text{TS_COSTS} - \text{IIF}(\text{TOT_OMAD} < 0, \text{TOT_OMAD}, 0) + \text{LINE_COSTS}) / \text{WTDA_TOT}$$

GA_RATE This is the computed actual G&A rate. This adds the excess costs for OMAD into the G&A costs here, and subtracts the G&A external revenue, as in:
$$\text{GA_RATE} = (\text{GA_COSTS} - \text{IIF}(\text{TOT_OMAD} < 0, \text{TOT_OMAD}, 0) - \text{GA_REV}) / \text{GA_TEC_SAL}$$

TOT_REV This is the total revenue (using the revenue confidence factors). This is:
$$\text{TOT_REV} = (\text{TOT_DIR} * \text{CFACT_DIR}) + (\text{TOT_CUST} * \text{CFACT_CUS})$$

TOT_EXP This is the total actual expenses, including the government loaded CPB, non-TDA costs, adjusted externals, and contractors. This is
$$\text{TOT_EXP} = \text{EXP_GOVT_N} + \text{EXP_ADJEXT} + \text{EXP_CONT}$$

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TOT_NET This is the total net revenue minus expenses. If displaying the actual G&A rate, then the expenses are the totals plus the excess OMAD costs, as in:
$$\text{TOT_NET} = \text{TOT_REV} - \text{TOT_EXP} - \text{IIF}(\text{TOT_OMAD} > 0, \text{TOT_OMAD}, 0).$$
If displaying the target G&A, then the expenses are modified by adding back in the actual G&A costs and subtracting the target G&A costs (amount taxed as G&A + G&A revenue), as in: $\text{TOT_NET} = \text{TOT_REV} - \text{TOT_EXP} + \text{GA_COSTS} - (\text{GA_REV} + \text{TOT_GA}) - \text{IIF}(\text{TOT_OMAD} > 0, \text{TOT_OMAD}, 0).$

In addition to the computed fields, the following values are computed and displayed on the main screen, but are not explicitly stored in the TDA_EVAL file.

TO_ALLOC This is the number of TDA spaces remaining to be allocated the Labs/Functions. This is: $\text{TDA_TGT} - \text{WTDA_TOT}.$

CONT/GOVT This is the ratio of contractor to government workyears $(\text{WKY_CONT} / \text{WKY_TOT}).$

IH/OH This is the in-house to out-house cost ratio. In house costs include costs for support contractors. This is: $(\text{EXP_GOVT_N} + \text{EXP_CONT}) / \text{EXP_ADJEXT}.$